

समाचार पत्रिका
नेपाल भौगर्भिक समाज

Volume 16

April 1999



**NEWS BULLETIN
OF
NEPAL GEOLOGICAL SOCIETY**

NEPAL GEOLOGICAL SOCIETY
(Est. 1980)

P.O. Box 231, Kathmandu, Nepal
Email: ngs@wlink.com.np

NEPAL GEOLOGICAL SOCIETY

TENTH EXECUTIVE COMMITTEE

1998-2001

President

Mr. Ramesh Kumar Aryal

Department of Mines and Geology
Lainchaur, Kathmandu, Nepal
Tel: 977-1-471372 (Res.)

Vice-President

Mr. Bashu Dev Kharel

Department of Mines and Geology
Lainchaur, Kathmandu, Nepal
Tel: 977-1-413965

General Secretary

Mr. Uttam Bol Shrestha

Department of Mines and Geology
Lainchaur, Kathmandu, Nepal
Tel: 977-1-253279

Deputy General Secretary

Ms. Roshani Karmacharya

Department of Mines and Geology
Lainchaur, Kathmandu, Nepal
Tel: 977-1-222717

Treasurer

Mr. Arjun Aryal

Department of Geology
Tri-Chandra Multiple Campus
Tribhuvan University
Ghantaghar, Kathmandu, Nepal
Tel: 977-1-473479 (Res.)

Members

Mrs. Shobha Singh

Department of Mines and Geology
Lainchaur, Kathmandu, Nepal
Tel: 977-1-412872

Mr. Rajendra Neupane

Department of Irrigation
Ground Water Development Project
Babar Mahal, Kathmandu, Nepal
Tel: 977-1-262953 (Off.)

Mr. Rajendra Prasad Khanal

Department of Mines and Geology
Lainchaur, Kathmandu, Nepal
Tel: 977-1-470810 (Res.)

Mr. J.B. Bajracharya

Nepal Electricity Authority
Ratnapark, Kathmandu, Nepal
Tel: 977-1-259866 (Res.)

Immediate Past President:
and
**Member of the 10th Executive
Committee**

Dr. Bishal Nath Upreti
Department of Geology
Tri-Chandra Multiple Campus
Tribhuvan University
Ghantaghar, Kathmandu, Nepal
Tel: 977-1-416386 (Res.)

Editorial

On behalf of the Nepal Geological Society and our own, we, the members of the Editorial Board, wish you all a very happy new year of 2056 B.S. It is also our pleasure to bring out the Bulletin of the Nepal Geological Society Volume 16, on this auspicious occasion. Apart from the Journal of Nepal Geological Society the Bulletin is a quite important publication, as it provides the information on meetings, seminars, and other various activities of the Society.

The Nepal Geological Society is planning to organise **the International Symposium on Engineering Geology, Hydrogeology and Natural Disaster with Emphasis on Asia**, in Kathmandu between September 28 and 30, 1999. We welcome all the delegates of the International Symposium and express our hearty felicitations and best wishes. We are confident that the International Symposium will prove to be an important forum for formulating new concepts and sharing ideas and views among the scientists.

This Bulletin is distributed to the members of the Nepal Geological Society as well as the other professionals working in Nepal and abroad. Keeping in view the increasing demand of popular geo-scientific articles, we have also included a few of them in this Volume. This Volume also includes the abstracts and papers presented on the occasion of the National Meeting cum Seminar on Natural Disaster Reduction Day - 1998.

We express our sincere thanks to all the persons who helped to collect the information and materials for the publication of this Volume. We also sincerely express our gratitude to the organisations and agencies that helped the Nepal Geological Society by providing the financial support and giving the advertisements in the Bulletin.

Thank you.

- M.R.D., K.P.K., B.M.J., V.C.T., and A.A.B

EDITORIAL BOARD

Chief Editor

Dr. Megh Raj Dhital

Central Department of Geology, Tribhuvan University

Kirtipur, Kathmandu, Nepal

Tel: 977-1-275579 (Res.)

332449 (Off.)

Editors

Mr. Krishna Prasad Kaphle

Department of Mines and Geology

Lainchaur, Kathmandu, Nepal

Tel: 977-1-428850 (Res.)

Mr. Bharat Mani Jnawali

Department of Mines and Geology

Lainchaur, Kathmandu, Nepal

Tel: 977-1-411139 (Res.)

Dr. V.C. Tewari

Wadia Institute of Himalayan Geology

33-General Mahadev Singh Road

Dehradun 248001 (UP), India

Tel: 91-135-624424, Fax: 91-135-625212

Dr. Aftab Ahmad Butt

Institute of Geology

University of the Punjab

Lahore-54590, Pakistan

Tel: 92-42-410229

LIST OF PUBLICATION OF NEPAL GEOLOGICAL SOCIETY

1. Journal of Nepal Geological Society Vol. 18 (**Special Issue**), 1998
(*Proceedings of the 2nd Nepal Geological Congress, 1997*)
2. Journal of Nepal Geological Society Vol. 17, 1997
3. Journal of Nepal Geological Society Vol. 16 (**Special Issue**), 1997
(*Abstract Volume of the Second Nepal Geological Congress, Nov 1997*)
4. Journal of Nepal Geological Society Vol. 15, June, 1997
5. Journal of Nepal Geological Society vol. 14 (**Special Issue**), Dec., 1996 (*Proceedings of 1st Nepal Geological Congress, Kathmandu, 1995*)
6. Journal of Nepal Geological Society vol. 13, June, 1996
7. Journal of Nepal Geological Society vol. 12 (**Special Issue**), August, 1995
(*Abstract volume of First Nepal Geological Congress, Kathmandu, 1995*)
8. Journal of Nepal Geological Society vol. 11 (**Special Issue**), April, 1995
(*Proceedings of 9th Himalaya-Karakorum-Tibet Workshop, Kathmandu, 1994*)
9. Journal of Nepal Geological Society vol. 10 (**Special Issue**), April, 1994
(*Abstract Volume of 9th Himalaya-Karakorum-Tibet Workshop*)
10. Journal of Nepal Geological Society Vol. 10, June 1994
11. Journal of Nepal Geological Society vol. 9, June, 1993
12. Journal of Nepal Geological Society vol. 8, June, 1992
13. Journal of Nepal Geological Society vol. 7, June, 1991
14. Journal of Nepal Geological Society vol. 7 (**Special Issue**), Feb. 1991
15. Journal of Nepal Geological Society vol. 6, December, 1989
16. Journal of Nepal Geological Society vol. 5 No. 1, August, 1988
17. Journal of Nepal Geological Society vol. 4, No 1&2, August, 1987
- 18*. Journal of Nepal Geological Society vol. 4 (**Special Issue**), June, 1984*
- 19*. Journal of Nepal Geological Society vol. 3, No1&2, December, 1985*
20. Journal of Nepal Geological Society vol. 2, No 2, January, 1983
- 21*. Journal of Nepal Geological Society vol. 2 (**Special Issue**), May, 1982*
22. Journal of Nepal Geological Society vol. 2, No 1, May, 1981
- 23*. Journal of Nepal Geological Society vol. 1, No 2, 1981*
- 24*. Journal of Nepal Geological Society vol. 1, No 1, 1981*

* Out of print (Xerox copy available on request).

Price of Journals

Volume	Country	Member	Non-Member or Institution
Regular/ Special [§]	Nepal SAARC Countries Other Countries	Rs. 100.00/150.00 US\$ 5.00 US\$ 8.00	Rs. 300.00/500.00 US\$ 8.00/10.00 US\$ 10.00/12.00
Vol. 18 (Sp. Issue)	Nepal SAARC Countries Other Countries	Rs. 200.00 US\$ 5.00 US\$ 8.00	Rs. 800.00 US\$ 10.00 US\$ 12.00

[§] Volumes 16, 14, 12, 11, 10, 7, 4 and 2

The price of journals does not include postal or bank collection charges.

CONTENTS

<i>Items</i>	<i>Page No.</i>
Editorial	
• NGS News	1
• 19th GENERAL BODY MEETING OF NEPAL GEOLOGICAL SOCIETY (नेपाल भौगर्भिक समाजको उन्नाइसौं वार्षिक साधारण सभा)	5
- Annual Report by Mr. D.N. Subedi, Secretary, NGS	5
- कोषाध्यक्ष श्री मुकुन्दराज पौडेलले प्रस्तुत गर्नुभएको २०५४/०५५ को आर्थिक विवरण	10
- Auditor's Financial Report of Fiscal Year 2054-055	13
- नेपाल भौगर्भिक समाजका नवनिर्वाचित महासचिव श्री उत्तम बोल श्रेष्ठबाट उन्नाइसौं साधारण सभामा प्रस्तुत मन्तव्य	17
- उन्नाइसौं वार्षिक साधारण सभामा भएका छलफल तथा निर्णयहरू	19
• BIENNIAL MEETING CUM OFFICE HAND-OVER CEREMONY OF NGS..	23
- Welcome speech by Dr. B.N. Upreti, Outgoing President of NGS	24
- Speech by Mr. R.K. Aryal, President-Elect, NGS	29
• INTERNATIONAL DECADE FOR NATURAL DISASTER REDUCTION, IDNDR DAY, October 12, 1998	33
- Welcome Speech by Mr. R.K. Aryal, President, NGS	34
- Speech by the Chief Guest, Hon. Minister of Home, Mr. Govind Raj Joshi	35
- Speech by Mr. Amod Mani Dixit, Coordinator, IDNDR Council, NGS	37
- Speech by the Chairman Mr. Padma Prasad Pokhrel, Secretary, Ministry of Home	39
- Speech delivered by Mr. M. Okamoto, Adviser, DPTC	41
- Vote of Thanks by U. B. Shrestha, Secretary, NGS	42
• ABSTRACTS AND PAPERS PRESENTED AT THE NATIONAL MEETING CUM SEMINAR ON NATURAL DISASTER REDUCTION DAY - 1998	43
- Environmental geological assessment of new settlement areas and various types of infrastructure in Kathmandu Valley: K.P. Kaphle	43
- देवी प्रकोप व्यवस्थापन - कार्यनीति: डा. मौनबहादुर पौड्याल क्षेत्री	45
- Disaster Management Plan for Hospitals: Dr. R.P. Shrestha	45
- प्रकोप व्यवस्थापनमा पत्रकारिताको भूमिका: श्रीरामसिंह बस्नेत	47
- Earthquake scenario - an effective tool for development planning: A.M. Dixit, L. Dwelley, M. Nakarmi, S. Basnet, S.B. Pradhanang and B. Tucker	51
- प्रकोप व्यवस्थापन तथा सञ्चार: विश्वमणि पोखरेल	53
- Building weaknesses and improvement measures: J.K. Bothara	54
- Street drama: "Jannai Parne Kura Haru": organised by Lutheran World Federation Nepal	54
- Sarsing (Rasuwa) Mb=5.4 Earthquake of 31 January 1997: G.R. Chitrakar, B. Kumar and U. Gautam	55
- Subsurface electrical imaging techniques for the investigation of the natural dam of Thulagi Glacier Lake: S.R. Pant and J.M. Renolds	57

• ARTICLES OF COMMON INTEREST	59
- Placer gold occurrences along the Rapti River around Tarule Area, Dang, Mid-Western Nepal: V. Dangol and P.D. Ulak	59
- नेपालमा धातु अन्वेषणमा भू-रसायनिक अन्वेषण प्रविधिको प्रयोग र त्यसको सफलता: कृष्णप्रसाद काफ्ले	61
- Engineering and environmental geological mapping in Kathmandu and Pokhara valleys: B.M. Jnawali and G.B. Tuladhar	63
- काठमाडौं उपत्यकाको भूकम्प जोखिम: माधव राज पाण्डे	66
• PARTICIPATION / REPRESENTATION OF NGS IN VARIOUS MEETINGS AND ACTIVITIES	68
• NEW MEMBERS OF THE NEPAL GEOLOGICAL SOCIETY	69
• GEO-SCIENTIFIC TALK PROGRAMMES	71
• CALENDAR OF EVENTS OF THE YEAR 1999/ 2000	71
• AWARD	73
• FILM SHOW	73
• AWARENESS	73
• RECENT PUBLICATIONS (NEW BOOKS)	75
• ANNOUNCEMENT	77
• CUTTINGS FROM NEWSPAPERS	78
- NGS named for UN Sasakawa Award	78
- प्राकृतिक प्रकोपको मारबाट विकासोन्मुख राष्ट्र बढि प्रभावित	78
- प्राकृतिक प्रकोपमा सञ्चारको भूमिका महत्त्वपूर्ण	79
- First Earthquake Safety Day in Nepal	79
• BIO-DATA OF HONORARY MEMBERS OF NGS	81
- Koshiro Kizaki	81
- Madhav Raj Pandey	82
• OBITUARY	84

The 19th Annual General Body Meeting of the Nepal Geological Society (NGS) was held on 28 August 1999 (12 Bhadra 2055) in the conference hall of Hotel Malla, Lainchaur, Kathmandu. The meeting was conducted under the chairmanship of Dr. B.N. Upreti, President, the Nepal Geological Society. This meeting was attended by the members of the Society. Most of the members took active participation in the discussions and decision-making. Before the commencement of the meeting, one-minute-silence was observed in the memories of Dr. C.K. Sharma, Hon. Member and John. H. Gray, Member of NGS, who died in the year of 1998.

The meeting was proceeded with the welcome speech of Dr. B.N. Upreti, President of NGS. It was followed by the presentation of annual report by Mr. D.N. Subedi, Secretary and annual financial report of the society by Mr. M. R. Poudyal, the Treasurer. After this presentation Mr. Uttam Bol Shrestha, General Secretary elect presented his speech on behalf of newly elected Executive Committee Members of NGS. His speech was focused on the future activities of NGS. It was followed by the active participation of members in the discussions on various topics and issues raised by the members.

In the same evening **Biennial Meeting and Office Hand-Over Ceremony** of NGS to newly elected Tenth Executive Committee were held under the chairmanship of Mr. P.P. Pokharel, Secretary, Ministry of Home in the conference Hall of Hotel Malla. Mr. Prithvi Raj Ligal, Vice-Chairman of National Planning Commission was the Chief Guest. At the beginning of the meeting, the outgoing President Dr. B.N. Upreti presented his welcome speech and highlighted on the activities conducted by the Ninth Executive Committee in its tenure of office. It was followed by the speech of Mr. R.K. Aryal, President Elect. He introduced the next

three-year programme of the new executive committee. On this occasion, Office Hand-Over Ceremony was also held by the outgoing Ninth Executive Committee to the newly elected Tenth Executive Committee. Hon. P.R. Ligal, Chief Guest, delivered a speech and highlighted on the important role of geo-scientists not only to search/ find minerals resources in the country but also in the national infrastructure development activities such as in the construction of roads, dams, irrigation canals, hydro-power plants, disaster management, soil conservation and hazard mitigation.

The Nepal Geological Society in cooperation with HMG/ Ministry of Home, IDNDR National Committee, Nepal, Water Induced Disaster Prevention Technical Centre (DPTC), UNDP-Nepal, National Society for Earthquake Technology, Nepal and Lutheran World Federation Nepal organised a one-day National Meeting cum Seminar on **Natural Disaster Prevention and the Media: Prevention Begins with information** to commemorate the UN declared **International Decade for Natural Disaster Reduction (IDNDR) Day 1998**, in the auditorium of Russian Cultural Centre, Kamalpokhari, Kathmandu on 14 October 1998. It was attended by more than 200 participants from various organisations and institutions. Nine technical papers were presented by the professionals who are directly or indirectly involved in various disciplines. The Inaugural Session was chaired by Mr. P.P. Pokharel, Secretary, Ministry of Home. Hon. Home Minister, Mr. G.R. Joshi was the chief guest. He inaugurated the Seminar by delivering a speech.

In the year of 1998/1999 the Nepal Geological Society organised a series of **geo-scientific talk programmes/ lectures on various topics** by inviting the distinguished national and international scientists and researchers.

Best Wishes
for
Grand Success to the
International Symposium on
ENGINEERING GEOLOGY, HYDROGEOLOGY
AND NATURAL DISASTER WITH
EMPHASIS ON ASIA
KATHMANDU, NEPAL
SEPTEMBER 28-30, 1999

GODAVARI MARBLE INDUSTRIES (P) LTD.
Kamal Pokhari

P.O. Box : 489

Tel. : Office - 422833, 422834

: Factory - 290565

Fax : 421530

Cable: GODMARBLE

Tlx. : 251EMCEE

A Memorandum of Understanding for professional exchange was signed between Highline Community College Des Moines, Washington, USA and the Nepal Geological Society in Kathmandu on 27 February 1999.

The representation of the Nepal Geological Society is being continued as in the past in various meetings, seminars and workshops organised by government and non-government organisations. The NGS represented in the following meetings in the year 1998/ 1999.

Five Nepalese members of our Society participated in the 14th Himalaya – Karakoram – Tibet Workshop held at Kloster Ettal, Germany, from 24 to 26 March 1999. Our team has proposed to hold the second time the HKT Workshop in Kathmandu, Nepal, on the occasion of its 25th Anniversary in the year of 2004. The Nepal Geological Society is going to organise an **International Symposium on Engineering Geology, Hydrogeology and Natural Disaster with emphasis on Asia** in Kathmandu, Nepal, on 28–30 September 1999.

First and second announcements (circulars) of the Symposium have already been circulated. More than 300 participants from various countries of Europe, America, Australia and Asia are expected to participate in the Symposium.

The Jury for the 1998-UN Merituous Certificate for Disaster Prevention has awarded a **Merituous Certificate to the Nepal Geological Society** for its efforts to disseminate scientific knowledge and to spread the awareness of prevention of natural disaster, and for the efforts made by the Society to encourage the scientific exchanges in sharing information through conferences, seminars and workshops.

The updated version of the **Member's Directory of the Nepal Geological Society** was published and circulated to NGS members. The Directory includes the address, telephone numbers, and other relevant information about the NGS members. The 19th General Body meeting has decided to publish a short bio-data of all the members in the future.

★★★

**BEST WISHES AND HEARTY FELICITATIONS
ON THE AUSPICIOUS OCCASION OF
HAPPY NEW YEAR 2056**

NEPAL ORIND MAGNESITE (P.) LTD.

(A Joint Venture Company of H.M.G. of Nepal & Orind Group of Companies)

Cha 2/776, Lazimpat, G.P.O. Box 1242 Kathmandu

Telephone: 418504, 410370

Fax: 418541, Gram : MAGNESITE

Telex: 2293 NEPMAG NP

**ALWAYS REMEMBER US FOR THE SUPPLY OF
TALC AND MAGNESITE PRODUCTS**

Dedicated to harnessing the mineral wealth for contribution to overall economic development of the country.

DO YOU KNOW ?

- Earthquake is one of the major destroyers of lives and properties.
- More than 15,25,000 people have died in this century due to fatal earthquakes.
- With more than 11,570 deaths, Nepal ranks 15th in earthquake related casualties.
- More than 75% of casualties throughout the world are attributed to building failure.
- In Nepal, more than 95% of earthquake related deaths are due to collapse/damage of buildings that have been designed and constructed without seismic safety.

DO YOU ALSO KNOW ?

- In Nepal, in an average, major earthquakes have been occurring every 100 years and medium earthquakes every 50 years.
- The great earthquake of 1934 (1990 BS) destroyed/damaged more than 207,200 buildings in Nepal and killed 8,519 persons.
- A building designed and constructed incorporating seismic safety measures saves lives and properties during an earthquake.
- We tend to spend lavishly on the finishing (marble, tiles, granite, plaster of Paris etc.) but compromise on professional design, supervision, and safety requirements.
- Incorporating earthquake safety measures in buildings would require only additional 2 to 6 per cent of cost.
- We can also strengthen existing buildings against seismic risks by retro-fitting.

Remember

Lavishness is not safety.

Investment on building safety is investment on your own security.

Safer buildings mean secure society.

Help raise awareness about seismic safety.

TAEC Consult P. Ltd. provides professional services for making your buildings safer. TAEC also helps identify, formulate and realise development schemes in the fields of:

- **Rural Infrastructure**
- **Water Supply**
- **Buildings**
- **Irrigation**

- **Planning**
- **Road**
- **Hydropower**
- **Socio-Economics**

TAEC Consult (P.) Ltd.

Anamnagar, PO Box: 2519, Kathmandu, Nepal

Tel.: 232863, 246563, 247258, 240258

Fax: (977-1) 225481, 244147

e-mail: taec@taecpl.mos.com.np

19th GENERAL BODY MEETING OF NEPAL GEOLOGICAL SOCIETY

नेपाल भौगर्भिक समाजको उन्नाइसौ वार्षिक साधारण सभा

१२ भाद्र २०५५ (२८ अगस्त १९९८) काठमाडौं, नेपाल

नेपाल भौगर्भिक समाजको उन्नाइसौ वार्षिक साधारण सभा २०५५ भाद्र १२ तदनुसार १९९८ अगस्त २८ का दिन समाजका अध्यक्ष डा. विशालनाथ उप्रेतीको सभापतित्वमा होटल मल्लको सभाकक्षमा सुसम्पन्न भयो। उक्त सभाको शुरुमा यस समाजका सम्माननीय सदस्य डा. चन्द्रकान्त शर्माज्यू तथा अर्का आजीवन सदस्य डा. जोन एच. ग्रेको स्वर्गारोहण भएको हुँदा उहाँहरूको आत्माको चिर शान्तिका लागि एक मिनेट मौन धारण गरी श्रद्धाञ्जलि अर्पण गरिएको थियो। तत्पश्चात् समाजका अध्यक्ष डा. उप्रेतीले स्वागत भाषणका साथै आफ्नो मन्तव्य प्रस्तुत गर्नुभएपछि समाजका सचिव श्री देवीनाथ सुवेदी र कोषाध्यक्ष श्री मुकुन्दराज पौडेलले क्रमशः समाजको वार्षिक प्रतिवेदन तथा आय-व्ययको विस्तृत विवरण पेश गर्नुभएको थियो। उक्त अवसरमा नवनिर्वाचित दशौ कार्यकारिणी समितिका महासचिव श्री उत्तम बोल श्रेष्ठले पनि नव-निर्वाचित का.का.स.को लफवाट आफ्नो मन्तव्य प्रस्तुत गर्नुका साथै आफ्ना भावि कार्यक्रमहरू बारे प्रकाश पार्नुभयो। तत्पश्चात् उक्त सभामा विभिन्न सदस्यहरूबाट उठाइएका विविध विषयहरूमा छलफल केन्द्रित राख्यो।

उक्त सभामा समाजका सचिव श्री देवीनाथ सुवेदीले प्रस्तुत गर्नुभएको वार्षिक प्रतिवेदन, कोषाध्यक्ष श्री मुकुन्दराज पौडेलले प्रस्तुत गर्नुभएको समाजको आर्थिक प्रतिवेदन, लेखापरीक्षकको प्रतिवेदन, नवनिर्वाचित महासचिव श्री उत्तमबोल श्रेष्ठद्वारा प्रस्तुत मन्तव्य तथा विविध विषयमा भएका छलफलहरू यहाँ प्रस्तुत गरिएका छन्।

Annual Report by Mr. D.N. Subedi, Secretary, NGS

**Mr. Chairman,
Respected members of the Society,**

It gives me a great pleasure to welcome you all to the 19th Annual General Body Meeting of the Nepal Geological Society, on behalf of the Executive Committee and myself in person. It has already been two years, since we took the responsibility of the prestigious office of the Nepal Geological Society. The Nepal Geological Society has made significant achievements in the past years in fulfilling the objectives of the Society. During the last two years, we have been keeping our effort to the extent possible to enhance the activities of the Society, and fulfil its objectives.

We have worked to the extent possible in running the activities of the Society as smoothly as possible. In this connection, I would like to inform you that in total, the Executive Committee met 22 times and made various decisions.

We have continued the regular programme to observe the IDNDR. A day-long National Meeting cum Seminars were organised on 9th October 1996 and 6th October 1997. At the end of the meeting cum seminar, resolutions were also passed by the

participants and they were sent to all the related national and international organisations, and agencies and His Majesty's Government of Nepal.

In connection with the International Decade for Natural Disaster Reduction (IDNDR) a Workshop cum Training on Natural Disaster Preparedness was organised on October 1996 and 1997.

As far as the publications are concerned, the Journal and News Bulletin of the Nepal Geological Society were published regularly. Printing and distribution of the Journal Volume 13 was completed in time. The proceedings of the First Nepal Geological Congress were published as the Special Issue of the Journal of Nepal Geological Society (Volume 14). Volume 15 was printed and distributed in time to the members of the Society. The abstracts of the Second Nepal Geological Congress were published as the Special Issue of the Journal of Nepal Geological Society (Vol. 16). Volume 17 has already come out of press. We request all our members to purchase the journals and help towards making the publication sustainable. Volume 18 is ready to go for print. Regarding the subscription of the

**Some people think Environmental Degradation is
inevitable sooner or later.
But we think otherwise.**

**For better environment and
quality laboratory services, consult**

**Nepal Environmental & Scientific Services
[NESS] (P) Ltd.**

Thapathali, Kathmandu, Nepal

Phone 244989, 215875 • Fax No. 977-1-226028

E-Mail: ness@mos.com.np

**Ours is the first Laboratory
accredited by Nepal Bureau of Standards and
Metrology under criteria of Singapore Laboratory
Accreditation Scheme (SINGLAS).**

Our specialized services include:

Surveying and Consulting for environmental studies:

- Geological and Topographical Survey
- Meteorological and Geophysical Surveys
- Biological and Ecological Surveys
- Geotechnical Surveys

Chemical analysis/consulting services for environmental pollution control:

- Chemical analysis of potable water and waste water for a) Inorganic b) Organic c) Heavy metals d) Pesticides etc.
- Chemical analysis of solid wastes, soils and dust particulates
- Monitoring ambient air quality in working environment
- Survey of noise and vibration pollution

Chemical analysis /consulting for any kind of raw materials, suppliers, makers, consumers and public works like:

- Food additives
- Chemical and chemical products
- Quality control tests for industrial products
- Analysis of rocks, soil, sediments etc.
- Study of special raw materials and their applications

Technical Services on:

- Environmental policies
- Air quality management
- Water/waste water management
- Industrial pollution management policies
- Design of pollution treatment systems
- AIE audit/monitoring
- Watershed management
- Consulting on socio-economic and engineering fields

Research and Development

Journal of Nepal Geological Society, now we have 30 subscribing members from the SAARC countries and 18 members from other countries. The number of subscribers is increasing rapidly.

As promised to the General Body about a year ago, we have published the updated Directory of Members of NGS, which will be useful for the members of the Society.

As per the decisions made by the General Body during the 18th Annual General Body Meeting, regarding the Rules and Regulations for election the Rules and Regulations Sub-Committee has prepared the final draft and now it is ready and will be presented in this meeting.

I have to report to the respected members of the Society that we have not been able to acquire the land in the premises of the Department of Mines and Geology (DMG) for construction of the NGS building. This matter has been again taken up, and with the favourable recommendation of DMG, the file has again reached the Ministry of Industry. We have been approaching to the respective authorities in the Ministry for an early and favourable decision. Let us hope that the newly elected 10th Executive Committee will be successful in getting the decision in favour of the Society, so that Society will have its own office building.

Scientific talk programmes were organised with the close cooperation of Scientific Sub-Committee. The first lecture was on multi-phase tectonic in the Indus-Zangbo suture zone in Ladakh, delivered by G. Fuch, and the other was on the erosion and sedimentation rate of the Himalaya by Christian France Lanord and the other one was Tunnelling by Marrinos.

The Scientific Workshop on the Tsho Rolpa Glacier Lake was conducted in the Russian Culture Centre in collaboration with the Nepal Engineering Association.

The Second Nepal Geological Congress

(NGCII) was organised on November 11-13, 1997; in which many geo-scientists from Nepal and abroad participated. This was an opportunity to our Nepalese members for sharing of knowledge and experiences as well as dissemination of finding of geological researches among the foreign participants.

The International Symposium on Engineering Geology, Hydrology and Natural Disaster, with emphasis on Asia, is going to be organised on September 28 to 30, 1999 sponsored by IAEG and endorsed by IDNDR Secretariat, Geneva and supported by UNESCO, UNDP Nepal ICOMOD and in association with various national and international organisations. The first circular of the symposium is being distributed now to the members.

The strengthening of NGS Library is a matter of concern to all of us. In this respect, we have made progress to some extent to collect books and scientific papers from various organisations. We are receiving journals from the exchange programme from various organisations such as Wadia Institute of Himalaya Geology, India; National Centre of Excellence in Geology, University of Peshawar Pakistan; BGR, Germany; Institute of Geology, Punjab University, Pakistan; and British Geological Survey.

I would like to inform the General Body that the Society has gained a considerable strength in its membership. The membership status is 433 members by now, out of which 423 are full members and 10 are associate members (international members from various countries).

The representation of the Nepal Geological Society is being continued in various workshops, seminars and meetings, organised by various ministries of His Majesty's Government and national and international organisations.

The question of representation of geologists in various organisations has been

Best Wishes
and
Hearty Felicitations
to
the Nepal Geological Society

BDA nepal (P) Ltd.

[Formerly Building Design Associates (P.) Ltd.]

Consulting Engineers • Architects • Planners • Valuers

INTRODUCTION:

Initially starting out as an Architectural and Engineering Consulting firm since 1974, BDA nepal (P) Ltd. has been also providing services in multi-disciplinary engineering fields including forestry, agricultural and socio-economic sectors. BDA nepal recently has widened its area of services further to Traffic Engineering (Junction Design, Road Marking and Road Signs) and Geotechnical Investigation sectors introducing the latest technology and design software.

Jhamsikhel, Lalitpur

Tel.: 5-34221, 5-23277 Fax: 5-23263

G. P. O. Box: 1353, Kathmandu, Nepal

email: bdanep@wlink.com.np

raised in the General Body Meeting time and again. For the fulfilment of this objective, we had a meeting with Director General of Department of Roads and had fruitful discussions.

We are also happy to inform you that the Nepal Geological Society has started consulting services from the last year. The first work that we received from UNDP was on preparation of a Comprehensive Data Base on Natural Disaster Management Capabilities in Nepal.

Dear members, whatever we have been able to do during the last two years it is due to your help, support and advice. On behalf of the executive committee and myself I would like to offer our sincere thanks to all of you for your active cooperation and continued support all the time. Various governmental agencies have provided technical and financial support to the society. The 9th Executive Committee would like to extend heartfelt thanks to those organisations and agencies and hope that such cooperation will be continued in the future. Particularly, I would like to mention here the following organisations.

- Department of Mines and Geology
- Petroleum Exploration Promotion Project
- Ground Water Resources Development Project
- Department of Irrigation
- Central Department of Geology, Kirtipur Campus, Tribhuvan University
- Department of Geology, Tri-Chandra Campus, Tribhuvan University
- Water Induced Disaster Prevention Technical Centre (DPTC)
- United Nations Development Programme (UNDP)
- Royal Nepal Academy of Science and Technology (RONAST)
- Ministry of Home
- International Centre for Integrated Mountain Development (ICIMOD)
- Lutheran World Service

- German Geological Advisory Team
- Environmental Geology Project (DMG/BGR)
- Nepal Electricity Authority
- Nepal Electricity Development Centre

We would also like to extend our sincere thanks to Mr. G.S. Thapa, Director General, Department of Mines and Geology for providing a separate room for the office of the Society.

We are also very much thankful to Godavari Marble Industries Pvt. Ltd. who has agreed to provide Rs. 15,000 for each publication of the Journal of Nepal Geological Society on a regular basis. It has already provided the fund to publish Volume 15.

On behalf of the 9th Executive Committee, I would like to extend our sincere thanks to Editorial Board and other various Sub-Committees for their effort to enhance the activities of the Society, and help the Executive Committee in all possible ways. Sincere thanks are also due to all the donors, advertisers and sponsors, for the support in various activities of the Society.

I would also like to extend our sincere thanks to the Election Sub-Committee who has successfully completed the election.

While working, there may have been shortcomings and weaknesses from our part. For this, I would like to take this opportunity to extend our sincere apology on behalf of the Executive Committee, before we leave the office of the Executive Committee. At this movement we should like to assure to the newly elected 10th Executive Committee that we will be available for any kind of help for a smooth transition of the office of the Society.

Distinguished members, as you know the tradition of biennial function of the Society is being conducted in co-operation with the newly formed 10th Executive Committee this evening at 6:30.

Thank you.

कोषाध्यक्ष श्री मुकुन्दराज पौडेलले प्रस्तुत गर्नुभएको २०५४/०५५ को आर्थिक विवरण

श्रीमान् सभापति महोदय,
आदरणीय समाजका पूर्व अध्यक्षज्यूहरू,
एवं नवौं कार्यकारिणी समितिका सदस्य साथी साथै
नेपाल भौगर्भिक समाजको दर्शौ का.का.स. मा विजयी हुनु
भएका साथीहरू एवं उपस्थित सम्पूर्ण समाजका साथीहरू:

सर्वप्रथम म यस समाजको उन्नाइसौं साधारण सभामा
उपस्थित हुनुभएका सम्पूर्ण सदस्यहरूलाई हार्दिक स्वागत
जमिनादन गर्न चाहन्छु। साथै नेपाल भौगर्भिक समाजको
१९औं वार्षिक साधारणसभामा कोषाध्यक्षको हैसियतले
०५४/०५५ को आर्थिक प्रतिवेदन पेश गर्ने मौका प्रदान
गर्नुभएकोमा नवौं का.का.स. साथै सम्पूर्ण साथीहरूलाई
धन्यवाद दिन चाहन्छु।

आदरणीय साथीहरू,

यस नवौं का.का.स.को दुई वर्षको कार्यकाल (२०५३-
२०५५) को यो वर्षको समाप्तिको दिन हामी यहाँ उपस्थित
भएका छौं। यो दुई वर्षको कार्यकालमा पछिल्लो आर्थिक
वर्ष (२०५३/०५४) को आर्थिक विवरण गत साल नै मैले
पेश गरिसकेको छु र आज म यस साधारण सभामा
२०५४/०५५ को दोस्रो वर्षको आर्थिक विवरण यस
समाजका लेखा परिक्षणबाट लेखा परीक्षण गराइ तपाईंहरूको
सामु पेश गर्दैछु।

साथीहरू, हाम्रो यो दोस्रो वर्षको कार्यकालमा हामीहरूले
2nd Nepal Geological Congress लाई सम्पन्न
गरेको कुरा त तपाईंहरूलाई अवगत नै छ, तसर्थ यस
दोस्रो वर्षको कार्यकालमा आम्दानी र खर्च दुवै बढेको
देखिन्छ। साथीहरू, Auditor को Report तपाईंहरू समक्ष
पुगिसकेको हुनाले म यहाँ संक्षिप्तमा विवरण पेश गर्ने
अनुमति चाहन्छु।

१) २०५४ साल श्रावण मसान्तसम्म (पहिलो आर्थिक
वर्षमा) हामीसँग
बैंक मौज्दात रु. ६,५९,३४८.६९
नगद रु. ४,९२४.००
जम्मा रु. ६,६४,२७२.६९

२) २०५४/०५५ को कार्यकालमा यस समाजबाट भएको
खर्च र आम्दानी
जम्मा आम्दानी रु. १४,००,९४२.७८
जम्मा खर्च रु. १,२७,४२५.७८

मुख्य मुख्य शीर्षकमा भएको आम्दानी

१) Contribution: विभिन्न संघ-संस्थाबाट दोस्रो
Geological Congress को लागि योगदान
Himal Hydro Rs. 10,000.00
WRC Rs. 5,000.00
ITECO Nepal Rs. 10,000.00
SRC Lab Rs. 15,000.00
BAD Nepal Rs. 15,000.00
GEOCE Rs. 15,000.00

Mr. & Mrs. Kyasitha	Rs.	5,000.00
Soil Test	Rs.	10,000.00
NAD Co.	Rs.	10,000.00
Silt Consult	Rs.	10,000.00
Sub-structural	Rs.	12,000.00
Metcon	Rs.	13,000.00
Masina	Rs.	5,000.00
Shah Consult	Rs.	5,000.00
NESS	Rs.	5,000.00
Kaligandki Impregilo	Rs.	29,000.00
RONAST	Rs.	15,000.00
NEST	Rs.	10,000.00
TAEC	Rs.	10,000.00
	Rs.	209,000.00

Kaligandaki Consultant	US \$	500.00
BGR/DMG	US \$	2,000.00
ICIMOD	US \$	2,000.00
Hazama	US \$	1,000.00
Nipon Koei 250	US \$	14,600.00
Total	US \$	20,100.00

तसर्थ 2nd NGC को लागि यो आर्थिक वर्षमा मात्र
२,०४,०००+३,७४,८२५ = जम्मा रु. ५,७८,८२५.००
उपलब्ध भएको थियो। साथै राइजिङ ट्रेडर, पुतलीसडकबाट
Congress मा करिब रु. दश हजार पर्ने २०० पान
Writing Pad पनि उपलब्ध गराइएको थियो।

२) IDNDR '97 मनाउनका लागि
UNDP बाट रु. ५६,८००.००
DPTC बाट रु. २९,४००.००
+ गृह मन्त्रालयबाट रु. १०,०००.००
जम्मा रु. ९६,२००.००
त्यस्तै IDNDR कै सिलसिलामा Luthern World
Service ले T.T. Programme चलाउनको लागि
समाजलाई रु. ५०,००० उपलब्ध गराएको थियो।

३) Nepal Geological Congress मा Registration
बाट समाजलाई उपलब्ध
नेपाली रकम रु. १,१३,५४२.००
US \$ रु. ५६,९०५.२५
जम्मा रु. १,७०,४४७.२५

४) यो बढेक विभिन्न शीर्षकमा (जर्नल विक्री, मेप विक्री
आदि भएको आम्दानी Auditor Report मा नै समावेश
भएको हुनाले यहाँ मैले भनिरहनु नपर्ने ठानेको छु।

यस समाजबाट मुख्य मुख्य शीर्षकमा भएको खर्च
१) Printing and Press रु. २,२३,३३२.००
(Vol. 15, 16, 17 + Bulletin No. 15 र Vol. 14

का केही भाग यसमा समावेश गरिएका छन् ।)

२. हामीले हाम्रो समाजको दैनिक काम बढ्दै गएको देखिएकोले र साथै Congress संचालनका लागि पनि आवश्यक भएको हुँदा यस आर्थिक वर्षमा Society को लागि एउटा Computer तथा Printer किनेका छौं र साथै E-mail पनि जडान गरेका छौं । तसर्थ यसमा रु. ६०,९५०.०० खर्च भएको छ ।
३. Seminar Bag for 2nd NGC = रु. ६८,४२०.०० + Loss
४. Catering Service + Dinner (2nd Nepal Geo. Congress मा) ३ दिनको रु. १,९२,०४०.०० मध्ये Society ले रु. १,६२,०४०.०० र Godavari M.L. ले रु. ३०,०००.०० (आम्दानी देखाउनुपर्ने)
जम्मा रु. १,९२,०४०.००
५. 2nd NGC मा Sponsered Candidates लाई Transporation बापत रु. ४२,९८४.८५
अन्य Congress + Other रु. २१,५८६.९५
जम्मा रु. ६४,५७१.९७

६. Hotel Bill मध्ये

18th NGS B.M.	रु.	९,३७५.००
Congress Lodging	रु.	२५,४००.००
जम्मा	रु.	३४,७७५.००

आदरणीय सदस्य साथीहरु,

२०५५ श्रावणसम्मको हिसाब हेर्दा

बैंक मौज्दात	रु.	९,९७,९५९.६७
नगद	रु.	२९,०३९.००
जम्मा	रु.	९,३८,९९०.६७
२०५२÷०५३ हामीले लिदा		
बैंक मौज्दात	रु.	३,८२,६०८.२६
नगद	रु.	१,७९७.००
जम्मा	रु.	३,८४,४०५.२६

- यस बाहेक हाम्रो यो कार्यकालमा Society को लागि Computer र E-mail गरी रु. ६०,९५०.०० को किनेका छौं । यसको अलावा एउटा स्टील दरान पनि Society को सम्पत्तिमा जोडिएको जानकारी गराउन चाहन्छु ।
- अन्त्यमा, हाम्रो यो २ वर्षको कार्यकाललाई हेर्दा आर्थिक क्षेत्रमा सौसाइटीको जम्मा रकम रु. ५,५४,६६५.४२ बढेको यस सभामा जानकारी गराउन चाहन्छु ।
धन्यवाद ।

25th anniversary

With Best Compliments
from



इस्ट कन्सल्ट
EastConsult

A National Consulting Organisation, committed to high standard of performance & technical excellence.

Areas:

Rural Roads, Trails & Trail Bridges & Rural Energy
Rural Water Supply & Environmental Sanitation
Waste Disposal & Management
Urban Infrastructure
Water, Waste Water Disposal & Management
Irrigation, Agriculture & Forestry
Water Resources Studies
Highways, Feeder Roads, Bridges, Airports, Ropeways,
Hydropower Development
Computer Application & Information Technology

Subsidiaries:

ESLA : East Soil Lab
EDCO : East Drilling Company
ESCO : East Surveying Company

Services:

Survey, Investigation & Design Works
Construction Supervision & Management
Computer-Aided Designs (CAD)
Socio-Economic Studies
Project Preparation
PES/EE & EIA (Environmental Studies)
Policy Studies
Participatory Projects Implementation
Community Development & Action Research Programmes
through EASTAP

NGO Outfit of EastConsult:

EASTAP: East Action Programmes

Engineers

Social Scientists

Economists

Development Planners

Best Wishes
To
NEPAL GEOLOGICAL SOCIETY
FROM
BUTWAL POWER COMPANY LIMITED (BPC)

Field of Activities:	Build, own and operate hydropower plants by maximizing use of local capability and institution building.
Accomplishments:	Tinau - 1 MW, Andhikhola - 5.1MW, Jhimruk - 12MW.
On-going Activities: <i>Project Development</i>	Khimti Hydropower Project (60 MW) through involvement as sponsor and party to engineering design, project management, training and technology transfer and other support services.
	Environment and community development services and various other consulting services i.e. feasibility studies, model studies, geotechnical studies etc. through its Hydroconsult Department.
Operation & Management	Andhikhola and Jhimruk Power Plants.
Rural Electrification	Syangja, Palpa and Pyuthan districts.

Address: Pulchowk, Lalitpur, P.O. Box: 11728, Tel: 538419/535595/538404 Fax: 527901

Auditors Financial Report of Fiscal Year 2054-055

The Members
Nepal Geological Society
Kathmandu.

Gentlemen,

I have audited the attached Receipt and Payment Account for the year ended on 32nd Shrawan, 2055, and reports as follows:

1. I have got all the information and explanations which are required for the purpose of audit.
2. Proper books as required are maintained according to Company's Law.
3. The attached Receipt and Payment Account and Income and Expenditure Account are drawn properly up in accordance with records which are made available to me.
4. According to the information given to me the attached Income & Expenditure Accounts prepared for the year ended 32nd Shrawan 2055 exhibit true and fair view.

Sd.

(Babu Raja Bajracharya)
Registered Auditor

Date: 10th Bhadra 2055

With the Best Wishes

from

GANESH HIMAL ZINC-LEAD PROJECT



NEPAL METAL COMPANY LIMITED

Gyantole, Gyaneshwor
Post Box 468, Kathmandu, Nepal
Phone: 412 657, 410 210 Fax: 00977-1-410 210

NEPAL GEOLOGICAL SOCIETY

Income and Expenditure Account

For the year Ended 31st Shrawan 2055

Expenditure	Amount	Income	Amount
To Advertisement	12,399.00	By Advertisement	20,470.00
To Audit Fee	4,000.00	By Contribution	2,04,000.00
To Advance	10,000.00	By Contribution (\$ 5500.00)	3,74,825.00
To Computer Service	13,800.00	By Life M. Fee	48,400.00
To Catering Service	1,62,040.00	By L.M.F. (\$100.00)	6,815.00
To e-mail Service	13,633.00	By Ordi. M. Fee	2,350.00
To Equipment	60,950.00	By ASSO. M. Fee	750.00
To Fuel	4,645.00	By Registration	1,13,582.00
To Hotel Bill	34,775.00	By Registration (\$ 835.00)	56,905.25
To Miss. Expense	37,288.15	By Geo. Map Sale	1,32,080.00
To Printing and Press	2,23,332.00	By Geo. Map Sale (\$50.00)	3,407.50
To Photocopy	34,914.00	By Journal Sale	37,810.00
To Postage and Telex	13,791.00	By Journal Sale (\$499.00)	34,006.85
To Refreshment	6,102.00	By Interest	27,638.45
To Remuneration	21,760.00	By Interest (\$347.89)	23,708.70
To Rent	14,760.00	By Miss Income (Different Exchange Rate and Others)	37,934.03
To Repair and Maintenance	1,545.00	By IDNDR'97	96,200.00
To Stationary	45,291.00	By UNDP Project	1,32,060.00
To Seminar Bag	68,420.00	By T.T. Program	50,000.00
To Transportation (2 nd NGC + Other)	63,771.97		
To Telex and Fax	8,259.00		
To Tax on Interest	1,421.68		
To IDNDR'97 Expense	80,916.00		
To T.T. Program Expenses	64,611.00		
To UNDP Project	1,15,000.00		
To Surplus (Income over Expenditure)	2,83,517.98		
TOTAL	14,00942.78		14,00942.78

Makunda Paudel
Treasurer

B. Subedi
Secretary

H. Subedi
President

S. Subedi
Auditor

NEPAL GEOLOGICAL SOCIETY

Receipt and Payment Account For the year Ended 31st Shrawan 2055

Receipt	Amount	Payment	Amount
To Cash A/C	4,124.00	By Advertisement	12,399.00
To Bank A/C	651,348.69	By Audit Fee	4,000.00
To Advertisement	20,470.00	By Advance	10,000.00
To Contribution	2,04,000.00	By Computer Service	13,800.00
To Contribution (\$ 5500.00)	3,74,826.00	By Catering Service	1,62,040.00
To Life M. Fee	46,400.00	By e-mail Service	13,633.00
To L.M. F. (\$100.00)	6,815.00	By Equipment	60,950.00
To Ord. M. Fee	2,350.00	By Fuel	4,645.00
To ASSO. M. Fee	750.00	By Hotel Bill	34,775.00
To Registration	1,13,582.00	By Misc. Expense	37,288.15
To Registration (\$ 835.00)	56,905.25	By Printing and Press	2,23,332.00
To Geo. Map Sale	1,32,080.00	By Photocopy	34,914.00
To Geo. Map Sale (\$50.00)	3,407.50	By Postage and Telex	13,791.00
To Journal Sale	37,610.00	By Refreshment	6,102.00
To Journal Sale (\$495.00)	34,006.85	By Remuneration	21,760.00
To Interest	27,635.45	By Rent	14,760.00
To Interest (\$347.89)	23,708.70	By Repair and Maintenance	1,545.00
To Misc Income (Different Exchange Rate and Others)	37,934.03	By Stationary	45,291.00
To IDNDR 97	96,200.00	By Seminar Bag	68,420.00
To UNDP Project	1,32,060.00	By Transportation (2nd AGC + Other)	63,771.07
To T.T. Program	50,000.00	By Telex and Fax	8,259.00
TOTAL	20,56,415.47	By Tax on Interest	1,421.68
		By IDNDR 97 Expense	80,916.00
		By T.T. Program Expenses	64,611.00
		By UNDP Project	1,15,000.00
		By NBL, Bhaktahity	16,114.23
		By NBL, Fixed A/C	37,000.00
		By NBL, Current	9,949.27
		By Nabil Saving	46,286.87
		By Nabil Fixed	29,000.00
		By Nabil (\$ 6638.10)	4,52366.52
		By ADB Saving	11,822.78
		By ADB Fixed (250400.00 for publication & research fund)	3,15,400.00
		By Cash in hand	21,031.00
		TOTAL	20,56,415.47

M. K. D. Paudyal
Treasurer

N. Subedi
Secretary

T. S. P. P. P. P. P.
President

S. P. P. P. P. P.
Auditor



SILT *Consultants (P) Ltd.*

BATTISPUTALI (BANESWOR)

P.O. BOX: 2724, Kathmandu, Nepal

TEL: 470866, 487598 • Fax: 977-1-473573

Email: silt@mos.com.np

website: <http://www.yomari.com/silt>

With the adoption of a unique multidisciplinary approach, quality performance, modern technology and back up facilities geared to meet the specific needs of the clients, SILT has gained a much valued reputation in the field of consulting services in Nepal. This has been possible also because SILT is operated by the board of eight (8) full-time working engineers/specialists and provides own permanent experts/specialists in most of the projects assigned.

The firm now provides the following services:

- Feasibility studies and preliminary planning
- Land use survey and mapping
- Drilling, in-situ and laboratory testing of rock, soil and construction materials
- Sub-surface exploration by geophysical methods
- Detailed survey and design of infrastructures (roads, bridges, irrigation and drainage, water supply and sanitation, hydropower system, building complexes and foundation structures)
- Slope stability analysis, hazard mapping and risk zoning
- Slope stability by the application of bio-engineering techniques
- Agricultural and socio-economic studies
- Environmental engineering and environmental impact assessment (EIA)
- Financial and economic analysis
- Preparation of pre-qualification/tender documents
- Evaluation of LCB and ICB contracts
- Construction management and supervision of construction works
- Establishment of operation and maintenance programs
- Conduction of training programmes and
- Project benefit monitoring and evaluation etc.

नेपाल भौगर्भिक समाजका नवनिर्वाचित महासचिव श्री उत्तम बोल श्रेष्ठबाट उन्नाइसौं साधारण सभामा प्रस्तुत मन्तव्य

श्री सभापति महोदय, आदरणीय एवं अध्यक्षज्यूहरू, सम्मानित सदस्यज्यू एवं सम्पूर्ण सदस्य साथीहरू,

सर्वप्रथम यस प्रतिष्ठित नेपाल भौगर्भिक समाजको दशौं कार्यकारिणी समितिमा हामीलाई निर्वाचित गरी आउँदो ३ वर्षको लागि यस समाजको विधान अन्तर्गत रही सदस्य साथीहरूका आकांक्षा एवं सुझावहरूलाई हृदयंगम गरी समाजको उद्देश्य अनुरूप समाजलाई जगाडि बढाउने अभिभारा दिनुभएकोमा यस समाजका सम्पूर्ण सदस्य साथीहरूलाई यस दशौं नवनिर्वाचित कार्यकारिणी समितिको तर्फबाट म हार्दिक धन्यवाद ज्ञापन गर्दछु।

१८ वर्ष लामो अनुभव बोकेको यस समाजले यसको स्थापनाकालदेखि नै आफ्नो मूलभूत उद्देश्य अनुरूप भूगर्भविज्ञानको विकास एवं सम्बर्द्धन गरी राष्ट्रिय विकासको लागि विभिन्न क्षेत्रहरूमा समाजले कार्यान्वयन गरेका विभिन्न वैज्ञानिक क्रियाकलापहरूद्वारा सक्दो योगदान पुऱ्याउँदै आइरहेको कुरा सर्वविदितै छ। विगतका दिनहरूमा यस समाजद्वारा संचालन गरेका कार्यक्रम र तिनको उपलब्धिहरू सचिव श्री देवीनाथ सुवेदीज्यूबाट प्रस्तुत इयवार्षिक प्रतिवेदनमा उल्लेख भइसकेका छन्। जस्तै यस समाजलाई विगतका दिनहरूमा राष्ट्रिय तथा अन्तर्राष्ट्रिय वैज्ञानिक संस्थाहरूबाट प्रशंसा एवं सहयोग भइरहेको विषय, आगामी दिनहरूमा पनि यस समाजका नयाँ कार्यक्रमहरूद्वारा यस समाजको प्रतिष्ठा कायमै राखि समाजको गरिमा उच्चस्तरमा पुऱ्याउन यस नवनिर्वाचित कार्यकारिणी समिति दुइ संकल्पित छ। यसका लागि हाम्रा सम्पूर्ण सदस्य साथीहरूबाट हर क्षेत्रमा सक्रिय सहयोग प्राप्त हुने नै छ भन्ने हाम्रो पूर्ण विश्वास छ।

यो दशौं कार्यकारिणी समिति यस समाजका नियमित कार्यक्रमको अलावा बितेका वर्षहरूमा सदस्य महानुभावहरूद्वारा उठाइएका अन्य विभिन्न विषयहरूको कार्यान्वयन र परिपूर्ति गर्न कटिबद्ध रहनेछ।

- प्रत्येक वर्ष भनाउँदै आएको IDNDR-DAY लाई निरन्तरता दिँदै IDNDR ले प्रतिपादित गरेको मूल उद्देश्य अनुरूप सम्बन्धित निकाय तथा Geo-scientist हरूको संलग्नतामा उक्त दिवस सम्पन्न गरिनेछ।
- आउँदो सन् १९९९ को सेप्टेम्बरमा अन्तर्राष्ट्रिय स्तरको IAEG को क्षेत्रिय सेमिनार गर्ने कार्यक्रम रहेको

छ। नवौं कार्यकारिणी समितिबाट चालनी गरिएका कार्यहरूलाई निरन्तरता दिने काममा यो राष्ट्रिय तथा अन्तर्राष्ट्रिय संघ-संस्थाहरू, भू-वैज्ञानिकहरू र सम्बन्धित निकायहरूको सहयोग तथा संलग्नताबाट यस सेमिनारलाई प्रतिष्ठित एवं सुचारु रूपले सम्पन्न गर्ने आवश्यक पर्ने विभिन्न उपसमिति (Organizing Sub-committee, Seminar Sub-committee, Fund Raising Sub-committee, Advisory Sub-committee इत्यादि) को गठन गरी प्रभावकारी रूपले सम्पन्न गर्ने यो कार्यकारिणी समिति दुइ संकल्प गर्दछ।

- सन् २००० मा सम्पन्न हुने Third Nepal Geological Congress मा सकेसम्म बढी राष्ट्रिय तथा अन्तर्राष्ट्रिय भू-वैज्ञानिकहरूको संलग्नता तथा सहयोग प्राप्त गर्ने उद्देश्यले सन् १९९९ सेप्टेम्बरमा सम्पन्न गर्ने IAEG को क्षेत्रिय Seminar जगावै आवश्यक Brochure तथा Circular हरू तयार पारी वितरण गर्ने सोचाई राखिएको छ।
- यस समाजले प्रकाशित गर्दै आएको Journal of Nepal Geological Society, News bulletin तथा अन्य Symposium हरूको Proceedings प्रकाशन उच्च प्राथमिकताका साथ समयमै सम्पन्न गर्ने भरमग्दुर प्रयास गरिने छ। समय समयमा Talk Program/Seminar/Workshop आदिको आयोजना भक्त प्रभावकारी रूपमा गर्न यस कार्यकारिणी समिति अग्रसर रहनेछ।
- सन् २००१ मा साकं स्तरीय भौगर्भिक सम्मेलन (GEOSAS IV) हुने कार्यक्रम रहेकोमा उक्त सम्मेलन नेपालमा पनि गराउन अति आवश्यक देखिन्छ। तसर्थ सन् २००१ मा सो सम्मेलन आयोजना गर्ने यस कार्यकारिणी समितिले श्री ५ को सरकार, विश्वविद्यालय तथा अन्य सम्बन्धित निकायहरूसँग समन्वय राखी कार्यक्रम गर्न भरमग्दुर प्रयास गर्नेछ।
- यस समाजको विधान अनुरूप नियम विनियम बनाउनका लागि गठित उपसमितिलाई निर्वाचन नियमावली तयार गर्ने काम हाल सम्पन्न भएकोमा

छुशी व्यक्त गर्दै उक्त समितिलाई धन्यवाद दिन चाहन्छु साथै समय समयमा विभिन्न सदस्य तथा वार्षिक साधारण सभाबाट औल्याइएका नपुग नियमहरूलाई आवश्यकता अनुरूप परिमार्जित गर्दै लगिनेछ ।

- भू-वैज्ञानिकहरूको उचित प्रतिनिधित्व हुनुपर्ने विभिन्न निकायहरू जस्तै: वातावरण मन्त्रालय, सडक विभाग, भू-संरक्षण विभाग, जल उत्पन्न प्रकोप नियन्त्रण केन्द्र (DPTC), खनिजमा आधारित उद्योगहरू र अन्य पूर्वाधार विकास कार्यक्रम आदिमा पेशासँग सम्बन्धित व्यक्तिहरूको सहभागिता गराउनेतर्फ भइरहेको प्रयासलाई सराहना गर्दै यस नयाँ कार्यकारिणी समितिले पनि उक्त कार्यलाई ठोस रूपले निरन्तरता दिई अगाडि बढाउन आवश्यक परेमा Seminar/Workshop इत्यादि गराई सम्बन्धित निकायलाई यस पेशाका व्यक्तिहरूको संलग्नता गराउन उत्प्रेरित गर्ने प्रयास गर्नेछ ।
- समाजको कार्यालय भवन तथा National Geo-

science Library स्थापनाको लागि जग्गा उपलब्ध गराउने सम्बन्धमा पूर्व कार्यकारिणी समितिबाट सराहनीय प्रयास भएको र यो दशौँ कार्यकारिणी समितिले पनि यस प्रयासलाई जारी नै राख्नेछ ।

- भौगर्भिक ज्ञानको अभावमा हुने भू-क्षय, environmental degradation, पहिरो इत्यादि नकारात्मक प्रभाव आदिको असर न्यूनीकरण गर्ने विषयसँग सम्बन्धित विज्ञहरूबाट प्रवचन, गोष्ठी, आदि गराइनेछ । यसरी आयोजना गरिने कार्यक्रममा सम्बन्धित क्षेत्रमा प्रत्यक्ष सरोकार राख्ने सरकारी तथा गैर सरकारी संघ-संस्थालाई समावेश गराउनेतर्फ प्रयास गरिनेछ ।

अन्त्यमा सदा भौ सम्पूर्ण सदस्य साधीहरूबाट बारम्बार यस नबनिर्बाचित कार्यकारिणी समितिलाई सहयोग एवं सरसल्लाह मिल्ने नै छ भन्ने अपेक्षा राख्दै आफ्नो मन्तव्य यहीँ टुङ्ग्याउन अनुमति चाहन्छु ।

धन्यवाद ।

With Best Compliments
to
NEPAL GEOLOGICAL SOCIETY
on the auspicious occasion of
Publishing its New Bulletin (Volume 16), 1999 Issue



from
NEPALCONSULT (P) LTD.
CONSULTING ENGINEERS & ARCHITECTS (ESTD. 1974)
Gushingal, Kupandol, Lalitpur-1, Nepal

Mailing Address:

G.P.O. Box 492, KTM, Nepal

Phone:

524379 & 536827

Fax:

0977-1-536824

e-mail:

nc@wlink.com.np

Field of Services

Water Supply & Sanitation
Airport Engineering
Structural Engineering
Transportation Engineering
Irrigation Engineering
Socio-Economic Studies
Electrical Power Engineering
Water Resources Studies
Training Programme

Survey & Mapping
Integrated Rural Development
Building Design & Planning
Geotechnical Investigations
Soil Engineering
Ground Water Engineering
Management Services
Advisory Services
Environmental Engineering

उन्नाइसौं वार्षिक साधारण सभामा भएका छलफल तथा निर्णयहरू

नेपाल भौगर्भिक समाजका अध्यक्ष डा. विशालनाथ उप्रेतीले आफ्नो स्वागत भाषण प्रस्तुत गर्नु भए पश्चात् यस समाजका सम्मानित सदस्य डा. चन्द्रकान्त शर्मा र अर्का सदस्य Professor Dr. John H. Gray को देहावसान भएको कुरा उक्त सभालाई अवगत गराउनुभयो र सोको समवेदना प्रकट गर्न शोक प्रस्ताव पेश गर्नुभएकोमा उक्त सभाले उहाँहरूप्रति हार्दिक श्रद्धाञ्जलि प्रकट गर्नुका साथै उहाँको आत्माको धिर शान्तिाका लागि एक मिनेट मौन धारण गरियो । उक्त सभाले शोक सन्तप्त परिवारप्रति समवेदना प्रकट गरी पत्र पठाउने निर्णय गर्‍यो ।

सत्यपश्चात् विभिन्न विभागहरू र संस्थाहरू (कार्यालयहरू) मा भूवैज्ञानिकहरूको पदस्थापना बारे यस का.का.स.ले के कस्तो काम गर्‍यो भन्ने प्रश्नको जवाफमा समाजका अध्यक्ष डा. उप्रेतीले सडक विभाग र भू-संरक्षण विभागमा यस विषयमा हेभिनेशन गर्दै उक्त विभागहरूका महानिर्देशकज्यूहरूलाई भेटी उक्त विभागहरूमा भूगर्भविद्हरूको दरबन्दोको व्यवस्था गर्ने अनुरोध गर्नुका साथै अनुरोध पत्र पनि दिइएको थियो र सम्बन्धित महानिर्देशकज्यूहरूबाट आफ्नो विभागमा भूगर्भविद्हरूको आवश्यकता महसूस गरिएको हुँदा सो सम्बन्धमा यथाशीघ्र कारवाही अघि बढाउने कुराको आग्रहासन मिलेको कुरा ज्ञात गर्नुभयो । त्यसका साथै वातावरण मन्त्रालय, DPTC जस्ता अन्य सरकारी निकायहरूमा सम्बन्धित व्यक्तिहरूलाई पटक पटक भेटी भूगर्भविद्हरूलाई उचित स्थान दिन आग्रह गरिएको थियो । यस सम्बन्धमा हालसम्म उक्त विभागहरूले ठोस कदम नचालेको हुँदा आउँछो का.का.स. ले पनि यस सम्बन्धमा ध्यान दिनुपर्ने

कुरा स्पष्ट पार्नुभयो ।

भू-विज्ञानमा र खास गरेर नेपाल हिमालयमा भौगर्भिक अनुसन्धानात्मक कार्यहरू गरी विशेष योगदान पुऱ्याएको आधारमा अग्रज दुइजना भू-वैज्ञानिकहरूलाई सम्मान गरी सम्मानित सदस्य (Honorary Member) प्रदान गर्ने परिपाटी यस ने.भौ.स.ले गर्दै आएकोमा यो वर्ष पनि सोको लागि उपयुक्त व्यक्तिहरू छनौट गरी उहाँहरूको नाम सिफारिश गरी का.का.स. मा पठाउन समाजका पूर्व अध्यक्ष एवं आजीवन सदस्य डा. रमेश प्रसाद बस्न्यालज्यूको संयोजकत्वमा गठित उपसमितिले जापानका भूगर्भविद् प्रोफेसर डा. कोशिरो किजाकी र नेपालका भूगर्भविद् श्री माधवराज पाण्डेको नाम सिफारिश गरी का.का.स. समक्ष पठाएकोमा का.का.स. ले उक्त नामहरू साधारण सभाबाट अनुमोदन (पास) गराउनका लागि पेश हुँदा साधारण सभामा सर्वसम्मतिबाट उहाँहरूलाई सम्मानित सदस्य प्रदान गर्ने निर्णय भयो ।

उक्त साधारण सभामा यस समाजका अर्का पूर्व अध्यक्ष एवं Rules and Regulation Sub-committee का संयोजक श्री अण्णुतानन्द भण्डारीले प्रस्तावित निर्वाचन नियमावलीमा उल्लेख भएका केही मुख्य मुख्य बुँदाहरूमा प्रकाश पार्नु भएपछि सुझावहरू माग्नु हुँदा छलफलको क्रममा श्री उपेन्द्र भक्त प्रधानाङ्ग र सत्य नारायण भन्ने नेपालमै तर काठमाडौं भ्याली बाहिरका सदस्यहरूले का.का.स. को कुनै पनि पदमा उम्मेदवारी दिन चाहेमा के गर्ने भन्ने प्रश्नको जवाफमा श्री भण्डारीले त्यस्तो परिस्थितिमा निजले आफ्नो उम्मेदवारीको निवेदन दर्ता गराउन सक्नेछ भन्नुभयो ।



'98 8 29

GEOMIC ENGINEERING CONSULTANCY

*Hearty Wishes to the Nepal Geological Society
for
Grand Success of the International Symposium
on*

**Engineering Geology, Hydrogeology and Natural Disaster
with Emphasis on Asia
Kathmandu, Nepal
September 28-30, 1999**

We are providing dedicatedly services in the following fields:

- Water Supply and Sanitation
- Survey, Design and Planning of Roads, Irrigation, and Hydropower Sectors
- Integrated Rural Development
- Geo-technical Investigation and Prefeasibility Studies
- Drilling and Material Testing
- Geophysical Exploration
- Soil and Ground Water Engineering
- Building, Physical Planning and Urban Development
- River Training and Flood Protection
- Exploration, Evaluation and Assessment of Mineral Resources
- Survey and Data Base
- Forestry, Environment and Socio-Economic Studies

**Contact Address:
Executive Director
Battishputali, Baneshwor
Phone No.: 495964**

ने.भी.स. का विदेशी सदस्यहरूलाई चुनावका बेला मतपत्र पठाउने कि नपठाउने र उनीहरूको मत गणना गर्ने कि नगर्ने भन्ने विषयमा उठेको प्रश्नमा श्री कृष्ण प्रसाद काफ्लेले हासो ने.भी.स. को विधान अनुसार विदेशी सदस्यहरू पनि हासो समाजका सदस्य हुन भने उनीहरूलाई आफ्नो मत दिने अधिकार भएको हुँदा गत वर्षहरूका चुनावहरूमा जस्तै उहाँहरूलाई मतपत्र समयमै पठाउनु पर्ने र उहाँबाट मत आएपछि निर्वाचनका दिन चुनावको समय सिद्धिए पश्चात् उक्त मतहरूलाई एकैठाउँमा मिलाई गणना गरिनु पर्ने कुरा व्यक्त गर्नुभएपछि यसमा सबैको सहमति रह्यो ।

सभाका अर्का सदस्य श्री माधवराज पाण्डेद्वारा विभिन्न पदका लागि मनोनयन पत्र दाखिला गरेका उम्मेदवारहरूको छोटो वायोडाटा मतपत्र साथै मतदाताहरूलाई पठाउन आवश्यक छ भनि उहाँले दिनुभएका सुझावको उत्तरमा चुनाव समितिले उम्मेदवारहरूको वायोडाटा मतदातालाई पठाउन गरेको कुरा स्पष्ट पारियो र यसको लागि Bio-data उम्मेदवार आफैले चुनाव समितिलाई उपलब्ध गराउनु राम्रो हो र यदि सो नभएमा नीजले सदस्यता विन भरेको फर्ममा उल्लेख गरेको विवरणको आधारमा Bio-data तयार गरी पठाउनु राम्रो हुने राय श्री नीरेन्द्र ध्वज मास्केले प्रस्ताव गर्नुभयो ।

नेपाल भौगर्भिक समाजका सदस्यहरू काठमाडौँ उपत्यका बाहेक नेपाल भित्रै पनि विभिन्न ठाउँमा रहेका र विदेशमा पनि भएका हुँदा अब आउने का.का.स. को विभिन्न पदमा चुनावको लागि केन्द्र र उपकेन्द्र राख्न राम्रो हुन्छ कि भन्ने प्रस्ताव श्री प्रयाग मान सिंह प्रधानले राख्नुभएकोमा यस उपर छलफल हुँदा विदेशमा हाललाई उपकेन्द्र राख्न नसकिने र स्वदेशमा पनि काठमाडौँ उपत्यका बाहेक जिल्ला वा क्षेत्रमा सदस्यहरूको संख्या निकै धेरै मात्र भएको अवस्थामा र चुनाव समितिले Advance Vote खसाल्न दिने व्यवस्था मिलाइदिने गरेको हुँदा हाललाई चुनाव उपकेन्द्र खोल्ने पर्ने आवश्यकता नभएको कुरा श्री अभ्यूतानन्द भण्डारीले पेश गर्नुभयो भने श्री कृष्ण प्रसाद काफ्लेले यसको पुष्ट्याई दिनु भएपछि सर्वसम्मतिबाट चुनाव उपकेन्द्र नखोल्ने निर्णय भयो ।

निर्वाचन समितिले निर्वाचनको क्रममा भैपरिआउने साना-तिना कुराहरूमा कामको प्रकृया, प्रकृति र औचित्यलाई विचार गरी गर्नुपर्ने हुँदा धेरै कुरा निर्वाचन नियमावलीमा प्रस्ट्याइरहनु नपर्ने कुरा डा. विशालनाथ उप्रेतीले प्रस्ताव गर्नुभयो ।

निर्वाचन हुनुअघि कुन दिनसम्म ने.भी.स. को सदस्यता लिने व्यक्तिले निर्वाचनमा भाग लिई मतदान गर्न पाउँछ भन्ने प्रश्नको उत्तरमा त्यस्ता नयाँ सदस्यहरूले निर्वाचनका लागि उम्मेदवारी दिने अन्तिम दिनसम्म सदस्यता लिइसकेका सदस्यले मात्र आफ्नो मत दिन पाउने व्यवस्था गर्नुपर्ने कुरामा सबैको सहमति भयो ।

श्री कृष्ण मुरारी अमात्यले Geology of Nepal नामक नक्साहरूको बिक्रीबाट प्राप्त रकम Geo-Scientific

Research Activities मा र Publication मा खर्च गरिनुपर्छ भन्ने प्रस्तावमा छलफल हुँदा सोझै अनुसार गर्नुपर्ने कुरामा सबैको सहमति भयो ।

NGS का Members हरूको Group Insurance गर्ने कि भन्ने प्रस्तावमा छलफल हुँदा यसमा आउँदा दिनहरूमा विचार गर्नुपर्ने राय सबैको राख्यो ।

Associate Member श्री सूर्य प्रकाश श्रेष्ठले ने.भी.स. को विधान अनुसार आफूले पूर्ण सदस्यता पाउँ भनि का.का.स. मा दिनुभएको निवेदन सम्बन्धमा छलफल हुँदा विधान अनुसार उहाँलाई पूर्ण सदस्यता दिन मिल्ने भएको हुँदा उहाँको सदस्यता Upgrade गरी पूर्ण सदस्यता दिन यस साधारण सभाबाट निर्णय गरियो ।

ने.भी.स. को आर्थिक स्थितिमा केही सुधार ल्याउन समयानुकूल सदस्यता शुल्कमा केही हेरफेर गर्न अत्यावश्यक भएकोले साविक सदस्यता शुल्क आजीवन सदस्यको लागि (नेपाल तथा अन्य सार्क कन्ट्रीजहरूबाट मात्र) रु. १०००/- बाट बढाई रु. १,५००/- साधारण सदस्यता शुल्क वार्षिक रु. १००/- बाट बढाई रु. १५०/- गर्नुपर्ने प्रस्ताव साधारण सभामा छलफलको लागि पेश हुँदा आजका मितिदेखि उक्त प्रस्तावित शुल्क लागू हुने गरी सर्वसम्मतिबाट निर्णय भयो ।

श्री नीरेन्द्र ध्वज मास्केले ने.भी.स. का सम्पूर्ण सदस्यहरूको Bio-data संकलन गरी Publish गर्नुपर्ने प्रस्ताव राख्नुभएकोमा श्री आमोदमणि दीक्षितले उक्त प्रस्तावको समर्थन गर्नुभयो भने नव निर्वाचित अध्यक्ष श्री रमेश कुमार अर्यालजीले उक्त कुरा अब आउने नयाँ का.का.स. ले कार्यान्वयन गर्ने प्रयास गर्ने आश्वासन दिनुभयो ।

गत वर्षहरूमा अन्तर्राष्ट्रिय स्तरका सेमिनार गर्ने र सोका Proceedings हरू छापने काम, IDNDR Day को कार्यक्रममा संचालन गर्ने, भुईँचासो जस्तो प्राकृतिक प्रकोपबारे सर्वसाधारण जनमानसमा awareness develop गर्न booklets हरू छापने र वितरण गर्ने, School का Teacher हरूलाई Geo-science र Disaster Management सम्बन्धी तालिमहरू संचालन गर्ने काम र श्री कृष्ण प्रसाद काफ्ले तथा श्री महेश नकरीले UNDP/DMS को request मा ने.भी.स. को तर्फबाट Disaster Management Capabilities in Nepal विषयक report तयार गर्नुभएको र 1998 - UN Sasakawa Disaster Prevention Award को जुरीले नेपाल भौगर्भिक समाजलाई 1998 Merituous Certificate for Disaster Prevention बाट सम्मान गरेकोमा सम्पूर्ण सदस्यहरूलाई खुशी लाग्नु स्वभाविक हो र अब आउने दिनहरूमा पनि नयाँ दशौँ का.का.स. ले यस सम्बन्धी विचार गरी थप कार्यक्रमहरू संचालन गरी समाजको नाम अझ माथि उठाउन सक्षम हुनेछ भन्ने कुरा सभामा उपस्थित सबै सदस्यहरूको शुभेच्छा भएको कुरा व्यक्त गरियो ।

*Best Wishes
and
Hearty Felicitations
on the
Auspicious Occasion
of*

**Organising the International Symposium
on
Engineering Geology, Hydrogeology
and Natural Disasters with Emphasis on Asia
Kathmandu, Nepal**

September 28-30, 1999

by

THE NEPAL GEOLOGICAL SOCIETY

HIMAL CEMENT CO. LTD.

Chobhar, Kathmandu

P.B.No. 321

Tel.: 330958, 331763

Fax: 330136

BIENNIAL MEETING CUM OFFICE HAND-OVER CEREMONY OF THE NEPAL GEOLOGICAL SOCIETY

The Biennial Meeting of NGS and Office Hand-Over Ceremony to newly elected Tenth Executive Committee were held in the conference hall of Hotel Malla in the evening of 28 August 1998. The meeting was chaired by Mr. P.P. Pokharel, Secretary, Ministry of Home, Hon. Prithvi Raj Ligal, Vice-Chairman of National Planning Commission was the Chief Guest. At the beginning of the meeting, Dr. B.N. Upreti, the outgoing President of NGS presented his welcome speech and highlighted on the activities carried out by the Ninth Executive Committee in its last two years. It was followed by the speech of Mr R.K. Aryal, President Elect. He stressed mainly upon the proposed programme for his tenure of office for next 3 years. It was followed by the NGS Office Hand-Over Ceremony by the outgoing Ninth Executive Committee to newly elected Tenth Executive Committee in the presence of the Chief Guest, other distinguished guests and NGS members. On this occasion Hon. P.R. Ligal, Chief Guest, delivered a speech and highlighted on the important role of geo-scientists not only to search/ find mineral resources in the country but also in the national infrastructure development activities such as in the construction of roads, dams, irrigation canals, hydropower plants, disaster management, soil conservation and hazard mitigation. He also advised that the Department of Mines and Geology must widen its activities to find out mineral resources and carry out infrastructure development activities in the country.



Dr. B.N. Upreti, the outgoing President, is handing-over the office of NGS to Mr. R.K. Aryal, the newly elected President of the Nepal Geological Society

Welcome Speech by Dr. B.N. Upreti, Outgoing President of NGS

Mr. Chairman, Mr. P.P. Pokharel, Secretary Ministry of Home;

Honourable Chief Guest, Mr. Prithvi Raj Ligal, Vice Chairman of the National Planning Commission; High officials of His Majesty's Government of Nepal; Mr. P.B. Malla, Honourable Member of Nepal Geological Society;

Ex-Presidents of Nepal Geological Society;

Distinguished guests;

Dear Fellow Members of Nepal Geological Society;

Ladies and gentlemen:

On behalf of the Nepal Geological Society and on behalf of my own, it is my pleasant duty to welcome you all in this evening to the 9th biennial programme of the Nepal Geological Society.

Let me also take this opportunity to express our sincere gratitude to the Hon'ble Vice Chairman of National Planning Commission Mr. Prithvi Raj Ligal for sparing his valuable time with us this evening and agreeing to become the Chief Guest in spite of his very busy schedule. We are equally thankful to Mr. P.P. Pokharel, Secretary, Ministry of Home for being with us here and accepting our invitation to become the Chairman of this function. Mr. Chairman and Honourable Chief Guest, we are really honoured by your gracious presence here in this evening, and greatly appreciate your goodwill shown towards the Nepal Geological Society.

The Nepal Geological Society attaches a great importance to this biennial function. This is an occasion when after the conference, where deliberations on various aspects of the society matters are made, we all meet in this installation ceremony of the new executive committee. This is the time when we review the achievements and shortcomings of the activities of the society during the last two years. Here the new executive committee proposes its future activities and makes a lot of commitments and promises. And over all, it is the pleasant occasion when we bring together all the well wishers and friends of the Nepal Geological Society and share our feelings with them.

At the outset let me congratulate all the members of the 10th Executive Committee of the Society for being elected. I wish you a very successful term of office. I am fully confident that during your tenure the society will attain new heights of achievements and prestige.

Mr. Chairman,

The Nepal Geological Society has completed 18 years of its establishment on the last April. Compared to the geological societies of other countries, our society is fairly young, but it is one of the few early generation scientific societies of Nepal. The society has traversed a long way to come to this stage. Starting with just 39 founding members in 1980, it has, as of today 433 members. Most geo-scientists of the world active or interested in the scientific research of the Himalaya-Karakoram-Tibet region are the members of our society; and quite a few of them are eminent personalities. Today, the Nepal Geological Society is recognised as an important scientific societies of this region especially in the SAARC countries. It has equally acquired international recognition. We all are proud to be the member of the Nepal Geological Society.

In any country national scientific societies have their important place and role to play. They are the leaders in their fields and represent the respective scientific community. Their role in various aspects of national development is crucial and inevitable. Scientific societies are not trade unions. Unfortunately, in Nepal under the existing Act, that governs the NGOs, scientific societies have greatly suffered due to the indifference between the regular NGOs, and the professional scientific societies. We strongly feel that the country needs a separate act to govern the scientific societies. Such societies must be registered preferably under the Ministry of Science and Technology under a new act. They must have strong support from the government. They must be given adequate roles and responsibilities in matters of national development in their related fields.

I want to stress here that the Nepal Geological Society is purely a scientific society committed to the development of geological science and thereby the development of the country. It is run and led by responsible scientists. The country can greatly benefit from the services it can render. Unfortunately, in Nepal the scientific societies are still marginalised. They are not adequately taken care and given due recognition to their professional capabilities and integrity by the government.

The importance of geo-science in the development of a country, I am sure, does not need any elaboration here to this august gathering. Nearly all types of infrastructure, such as roads, dams, bridges and tunnels, need input of geo-scientific knowledge in all stages of planning, design, implementation as well as maintenance. Mineral and water resources development, environmental studies and protection, studies and mitigation of natural disasters such as earthquakes, floods, landslides and volcanoes. Need geo-scientific knowledge. Today in many countries of the west, geo-science education has been given a high priority right from the early school age. It has been realised that the cause of the alarming rate of environmental degradation that we have experienced during the last few decades and that continues today, is due to the general ignorance by the policy makers and bureaucrats about how the earth system works. Therefore, the decision makers of tomorrow must understand well the functioning of our planet and operating natural processes, so that knowingly or unknowingly no crime is committed against the Mother Earth.

Strange enough, even today, when we are about to enter to the 21st century, the role of geo-scientists is not yet fully realised in Nepal. I personally believe that geo-scientists are still marginalised in our country. In spite of repeated approach and persuasion, it is strange to find that organisations like Department of Roads, Ministry of Science and Technology, Ministry of Population and Environment have not employed any geologists. It looks most strange when we see the Department of Soil Conservation, an organisation which works on study and stabilisation of landslides and soil erosion control in over 50 districts of Nepal, and supposed to be an interdisciplinary organisation in nature, has just one geologist working for the department.

At the same time, we strongly feel that an institution like the National Planning Commission needs backing of a strong team of geologists. It is again strange that Planning Commission has never been represented by any geologist in the past except for a brief period by Dr. C.L. Shrestha. National Planning Commission which has such an important role in planning and development of water resources which includes construction of dams and reservoirs, hydropower development, other

infrastructures like roads and bridges and planning for irrigation, both surface and groundwater, is never backed by geo-scientists. For a sustainable development, I believe, adequate roles should be given to appropriate professionals wherever their role is essential. Otherwise, a country like Nepal which lies in the most fragile and dynamic mountain system of the world, all its efforts towards development will be just futile. Two years ago on this same platform, I had also mentioned about the importance of services of geologists in Nepal Army.

Mr. Chairman,

Now, I may very briefly mention here some of the important works that the society was able to carry out in the last two years.

The society gives a very high priority in the publication of its scientific journal and bulletin. The journal of the Nepal Geological Society is one of the very few regular scientific journals being published from Nepal and without missing any issue for the last 18 years. Internationally, it has a good reputation as a scientific journal and is being subscribed by many national and international libraries and individuals. During the tenure of our executive committee, we have published 5 volumes of the journal including the special issues (Vol. 13-17). The journals were published in time and we have tried our best to maintain a high professional standard. First time from Volume 15, we have also started colour pages to be included. We have also added international members in its editorial board. We hope this will help to further improve the quality of the journal by better reviewing and editing. We have also significantly increased the sale of the journal both at internal and international levels. Now we have introduced the subscription system. Any member or institution can deposit in advance some fixed amount as subscription. The subscriber will receive the journal in time to his address as soon as the journal is out of press. We sincerely request to all our members to subscribe the journal which will greatly help towards its sustainability. The Godavary Marble Industry has come forward to help the publication of the journal by contributing Rs 15,000 for each regular issue. The Nepal Geological Society greatly appreciates this gesture of the Godavari Marble Industry.

Similarly, we have tried to improve the quality of the bulletin both in its content and printing. We have also increased the circulation of the bulletin and now reached to a wider audience. However, I may add here that this improvement has not cost the society any extra financial burden. Nearly all the cost of publishing has been met from the advertisements.

A year before, we have published an updated version of the brochure of the Society and was distributed to you. We have also brought out the new updated version of the Directory of the Members of the Nepal Geological Society and distributed free of charge. Now the directory is put in the computer database and can be updated regularly. Similarly, the revised constitution of the Nepal Geological Society has been printed and being distributed.

Mr. Chairman,

Regarding other activities of the Society, as in the previous years, the Society observed the International Decade for Natural Disaster Reduction (IDNDR) day in collaboration with the Ministry of Home, DPTC and UNDP Nepal. We also conducted two training programmes on Natural disasters reduction to High School science teachers of Kathmandu valley in collaboration with the Lutheran World Services, Nepal and Ministry of Education.

The Nepal Geological Society successfully organised the Second Nepal Geological Congress which was attended by over 250 participants from 11 countries including Nepal. I am happy to mention here that the number as well as the quality of papers presented by the Nepalese geo-scientists was very high. It was a proud moment to the Nepal Geological Society to see such a good representation of its members in an international gathering. Last year the Society also organised a one-day seminar on Tso-Rolpa Glacier Lake in collaboration with Nepal Engineers' Association.

As a regular programme, the Society organised a number of lecture programmes from various geo-scientists visiting Nepal. I am also happy to inform you that the society has become the country member of the International Association for Engineering Geology and the Environment (IAEG). Through the Society many of our members have also become the members

of IAEG. A few months before, the president of IAEG Prof. Paul G. Marinos had visited Nepal and was very appreciative of our activities. As a result, he readily agreed to our proposal to host one international symposium under the sponsorship of IAEG. I am very happy to announce here that we have decided to organise a symposium on **"Engineering geology, Hydrogeology and Natural disasters with emphasis on Asia"** during 28-30 September, 1999, that is about after one year from now. The first announcement is already in your hands. The symposium is endorsed by the IDNDR Secretariat, Geneva, and supported by international organisations like UNESCO, Paris, UNDP, Nepal, ICIMOD and GTZ/BGR Germany. Many of the national organisations have already committed to support the symposium. I am fully confident that organisation of this symposium will further enhance the credibility and recognition of the society in the international level. I am quite confident that we are handing over this upcoming international event to the able hands of the new executive committee and wish them all the best for the successful completion of the symposium.

I am also happy to announce here that the Nepal Geological Society has decided to award the Honorary membership to two distinguished geo-scientists: Mr. Madhav Raj Pandey from Nepal and Professor Koshiro Kizaki from Japan. The award will be presented to them during the inaugural ceremony of the International symposium in September, 1999.

Not that we could achieved what we had promised two years before from this same forum when we took office. We tried our best to further the process towards getting lease on a piece of land in the premises of the Department of Mines and Geology. Presently, it is pending with the Ministry of Industry. I hope the ministries concerned will favourably consider this matter. This is the most important and critical work that we are leaving behind for the new executive committee. We led delegation to the Department of Roads for inclusion of a few geologists in the Department. The then Director General was very positive and considerate and fully realised that the department needs the services of geologists. However, we are still looking forward for action. I hope the new executive committee will pursue on this matter. Similarly the new executive

committee has to further approach to other various organisations, which I mentioned above for inclusion of adequate number of geologists in their organisational structures.

As a president, it becomes my duty to thank to all our well wishers and friends who have so consistently helped us in our endeavours. Without their helps and cooperation we could not have achieved what I have mentioned above. We are thankful to the Department of Mines and Geology for providing a room to run the office of the Society. We are grateful to the Director General Mr. Gopal Singh Thapa for this kind gesture towards the Society. The 9th Executive Committee would like to extend its sincere thanks to the national and international organisations, consulting firms, and mineral based industries for their help and cooperation. We are particularly thankful to ICIMOD, UNDP/Nepal, Lutheran World Service, German Geological Advisory Team (GTZ/BGR). The consulting firms have been always so kind and helpful whenever the society has approached them for the financial help and cooperation, whether it be for the

organisation of the Congress or for the advertisement in the Bulletin. They have in fact become a part of our family. It is my pleasant duty to thank them here once again. The Department of Irrigation, Groundwater Resources Development Project, Nepal Electricity Authority, Electricity Development Centre, Tribhuvan University, Petroleum Exploration Promotion Project, and Ministry of Industry have always come forward for every help to the Society. I am pleased to express our sincere thanks to all these organisations.

I was very fortunate to work with a very dedicated and hard working team of colleagues. Without their constant support we could not have achieved much. I would fail in my duty if I do not acknowledge their hard work and support. However, I must take responsibility for all the shortcomings and for which I sincerely extend my apology.

With this I welcome you once again. I thank you very much and wish for a pleasant evening.

Thank you.

**WE PLEDGE TO DEDICATE OUR
PROFESSIONAL SERVICES TO NEPAL IN
THE FOLLOWING FIELDS:**

- Rural Infrastructure Development Services
- Engineering Services
- Geotechnics, Bio-Engineering & Soil Conservation
- Small Hydropower & Rural Electrification
- Ropeway Studies
- Management Consultancies
- Environmental Studies
- Socio-Economic Studies



ITECO NEPAL (P) LTD.

P.O. Box 2147, Min Bhawan, New Baneshwor, Kathmandu, Nepal
Tel: +977-1-482385, 483153, 493764, 493839, Fax: +977-1-482298
Email: iteco@mos.com.np

Tunnelling
under Himalayan rock condition
is not easy.
Geologists predict the difficulties
but we solve them.

*From Tinau, Andhikhola, Tatopani and
Jhimruk Projects to Khimti, Modi and Melamchi*

HIMAL HYDRO

is always there.

HIMAL HYDRO

*The leading national company
in the field of*

**Hydropower, Tunnel, Ropeway and
Transmission Line Construction**

Contact Address: Phone: 535032, Fax: 524350
email: mail@himalhydro.com.np

Speech by Mr. Ramesh Kumar Aryal, President-Elect, NGS

Mr. Chairman, P.P. Pokhrel, Secretary
Ministry of Home;

Honourable Chief Guest, Dr. Prithvi Raj Ligal
Vice-Chairman, National Planning
Commission, Nepal;

Honourable Member, Mr. P.B. Malla;

Distinguished Guests;

Dear Members of NGS;

Ladies and Gentlemen:

It is my great pleasure to welcome all of you again in this grand biennial function of the Society.

On behalf of all the members of the newly elected Executive Committee, I take this opportunity to express our deep gratitude to all the members of the Nepal Geological Society for electing us to the Tenth Executive Committee that is to serve for the next three years.

Please allow me also to thank the office bearers of the Ninth Executive Committee, the previous Presidents and Executive Committee Members whose vision and hard work were instrumental in developing the Nepal Geological Society into a prestigious institution, which is recognised nationally and internationally. We, the newly elected executives, pledge to work hard to continue the grand tradition of this scientific society, to identify new avenues for assisting the countries programme of national development, to chart out additional programmes for projecting the image of Nepalese geo-scientists and their contributions internationally, to strengthen dialogue and communication with individuals and institutions for a still better use of the nationally available professional expertise. In this quest, we very much expect to receive constant guidance and valuable suggestions not only from the members, but also from all present here. To the members of the Nepal Geological Society we sincerely request for your active participation and cooperation in all the future activities.

Dr. Upreti, the outgoing President, has already highlighted the past activities of the Society. Let me now outline the future

programmes that the newly elected Executive Committee would try to implement.

First, all the regular activities of the Society such as publication of the Journal, Bulletin, proceedings of seminars, observance of IDNDR Day, organisation of thematic lectures and training programmes, advocacy for better use of the mineral resources and preservation of the environment, responding to the natural disasters, etc. will be continued by the Tenth Executive Committee. The Society will seek wider participation of individuals and institutions in undertaking these activities.

The Society will also continue its effort to acquire land for the office building and the Geoscience library of the Society.

Keeping up the tradition of geological congresses on a regular basis, we will organize the Third Nepal Geological Congress in the year 2000 AD. We are happy to note that the NGS Congresses bear a regional character because of the participation of geo-scientists from the surrounding countries. Thus, we are contributing to the development of understanding and interaction between the scientists of the region. Such relationship forms what can be construed as the basis for the cordial relationship between the people and governments of different countries of the region.

Another of the NGS landmark will be the organisation of the IAEG International Seminar in 1999 AD. NGS is the national member of the International Association of Engineering Geology (IAEG). IAEG is devoted to the science of engineering geology- the science of the use of geology in infrastructure development and preservation of the environment. We are thankful to the outgoing Executive Committee, especially to Dr. Upreti, for getting the affiliation with IAEG.

Another area where the Tenth Executive Committee will put efforts is to prepare ground for the organisation of one of the future GEOSAS meetings in Kathmandu. GEOSAS is a SAARC level Geological Congress, organised by the

DIP CONSULTANCY (P) LTD.

Development through
Integrated Planning

CONSULTING ENGINEERS, ARCHITECTS AND PLANNERS

STUDY AREAS:

- **SURVEY, DESIGN AND PLANNING OF ALL PHYSICAL INFRASTRUCTURES: ROADS, IRRIGATION, WATER SUPPLY, HYDROPOWERS**
- **GEOLOGICAL AND GEOPHYSICAL EXPLORATION**
- **SOCIO-ECONOMIC AND ENVIRONMENTAL STUDIES**
- **TOPOGRAPHICAL SURVERY**
- **PRODUCTION OF MULTICOLOURED MAP**
- **WATER RESOURCES PLANNING AND DEVELOPMENT**
- **CONSTRUCTION SUPERVISION**

**G.P.O. BOX: 4903, TEL: 418010, 429645
DILLIBAZAAR**

governments of the member countries. Such regular congresses have been organised in Pakistan and Sri Lanka in the past. Shortly the GEOSAS III will be organised again in Pakistan. While organising GEOSAS, we find that the respective central governments provide the hardware and the organisation itself is done by the combined efforts of the concerned governmental and academic departments, the geological societies of the countries, with involvement of the private sector. The Nepal Geological Society would like to initiate preliminary works because the organisation itself takes two or three years. We look forward to a positive response to it from the government and the academia.

I understand that all what I have said so far portrays a rosy picture of our glorious history, achievements, and a confident future. Nevertheless, may I here recall that we are not without problems, and the path ahead is not an easy one. It is full of constraints. No doubt that the Society, which runs on membership fees and donations, suffers from financial constraints. These constraints will continue in the future also. However, we know how to go ahead with the activities because there are people and institutions who understand the value of our work and contribute for the organisation of particular and specific activities. We thank them all.

However, the biggest constraint is probably that of concept. One of such constraints is the prevailing regulation that classifies the national professional societies as "non-governmental organisation". Such classification puts professional institutions like NGS into the large basket called NGOs. Such classification has greatly hindered an effective utilisation of the services of professional bodies. A new instrument needs to be developed for establishing an effective and meaningful relationship between the government and the professional societies.

Another conceptual constraint concerns the use and potential use of geology in various sectors of national development. The traditional concept of geology in its strict sense as a science

related exclusively and only with mineral exploration still prevails amongst even the policy makers. There has been some change in attitude in some institutions and the use of geological sciences and geologists is getting wider in infrastructure development such as roads, irrigation, water supply and hydropower projects.

In these sectors also, such use of Geoscience looks restricted to planning and design phases only. Rarely has such practice extended to works at the site level. Important sector such as agriculture, urban development, and environmental and heritage preservation have not been able to exploit the potential services from the science of geology and geotechnics. We need to initiate effective dialogue with concerned authorities.

The Nepal Geological Society wishes to strengthen its relationship with the government. We also wish to formalise our relationship with the universities and other professional societies. So far our cooperation has been based on mutual understanding. We need to develop it into a mechanism of sustainable cooperation. To start with, we propose to sign Memoranda of Understanding with the different government, academic and professional institutions. Based upon these MOUs, we can develop concrete agreements for specific works.

We do hope that the government organisations, national and international agencies, mineral based industries, and engineering and geotechnical consulting agencies will continue their support as in the past.

Your valued presence here this evening provides us the encouragement to do all these. We attach great importance to your opinion, advice, guidance and critique, formally or informally, during this evening, and in times to come. We will always be ready for any dialogue and communication for the application of the science of geology in the national development, in the task of providing services to the common Nepalese.

Thank you.

1131



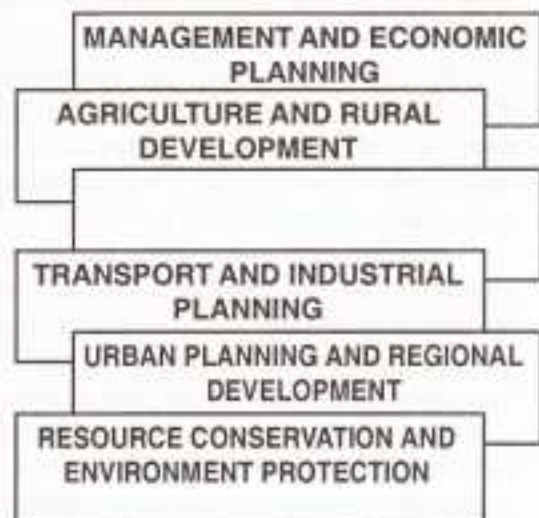
METCON CONSULTANTS

P.O. Box 4412
Cha 2/655, Tangal
Kathmand-2, Nepal

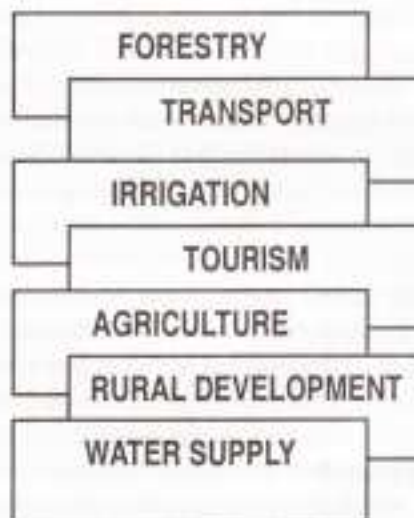
Telephone: (01) 412902, (01) 414537
Telefax: (01) 418478
Telex: 2495 METCON NP

Metcon Consultants (Management, Engineering and Technology Consulting) a multidisciplinary consulting firm was established and registered in 1981 with a view to providing its best consultancy services for plan formulation and policy studies; pre-investment studies; design and supervision services for construction works; specialised design and development services; project management; advisory services; evaluation studies and monitoring works in different socio-economic, managerial and technical fields.

Field of Activities



Field of Activities



INTERNATIONAL DECADE FOR NATURAL DISASTER REDUCTION (IDNDR DAY, OCTOBER 14, 1999)

National Meeting cum Technical Seminar on

Natural Disaster Prevention and the Media: Prevention Begins with Information

To commemorate the IDNDR Day-1998, the Nepal Geological Society, as in the previous years, organised a one-day National Meeting cum Seminar on "Natural Disaster Prevention and the Media: Prevention Begins with Information" in Kathmandu in collaboration with the Ministry of Home, National Committee for IDNDR Nepal, Water Induced Disaster Prevention Technical Centre (DPTC), National Society for Earthquake Technology- Nepal, UNDP Nepal and Lutheran World Federation Nepal on 14 October 1998. The United Nations has declared the year 1991-2000 as the International Decade for Natural Disaster Reduction. Second Wednesday of October is the IDNDR-Day. The topic of meeting for the year 1998 as given by UN is Natural Disaster Prevention and the Media: Prevention Begin with Information. The Nepal Geological Society is responding UN declaration since 1991 by organising one day national meeting cum seminar every year. NGS on request of UN/ DMS has also prepared a database on Disaster Management Capabilities in Nepal 1997, published awareness booklets, posters and organised training to the school teachers.

Mr. P.P. Pokharel, Secretary, Ministry of Home, was the chairman of the Inaugural Session of the meeting cum seminar. Honourable Home

Minister Mr. G.R. Joshi was the Chief Guest. Hon. Minister inaugurated the seminar and delivered his inaugural speech. In his inaugural speech he appreciated the activities carried out by NGS and stressed on the needs to make aware of the people about various types of natural disasters and their effects and teach the people how to be prepared for such events and reduce the possible damage. At the beginning of the Inaugural Session, Mr. R.K. Aryal, President of NGS delivered the welcome speech and pointed out various activities carried out by the Society in the past. Mr. A.M. Dixit, Coordinator of NGS/ IDNDR Council highlighted on the IDNDR concept and its importance. In this Inaugural Session, Mr. G.S. Thapa, Director General, Department of Mines and Geology, Mr. Mukund Poudyal, Project Director, DPTC, Mr. M. Okamoto, Adviser, DPTC, Mr. Bill Berger, UN/ DMS also presented their views about the IDNDR Day.

The Inaugural Session was followed by Technical Sessions. In these sessions nine technical papers on various aspects related to various types of disaster and environmental degradation, were presented and discussed. Available speeches of the guests and abstracts of the papers presented in the Seminar are given below.

Welcome Speech by Mr. R. K. Aryal, President, the Nepal Geological Society

Respected Chairman Mr. Padam Prasad Pokharel,
Secretary, Ministry of Home;

Chief Guest, Honourable Minister, Mr. Govind Raj
Joshi, Ministry of Home;

Mr. G. S. Thapa Director General, Department of
Mines and Geology;

Mr. A.M. Dixit, Coordinator, IDNDR- Committee,
NGS;

Mr. William S. Berger, Coordinator, Disaster
Management Secretariat, NDP/NEPAL;

Mr. Masao Okamoto, Chief Advisor, DPTC/NEPAL
Madame Shanta Laxmi Shrestha, Deputy

Representative, Lutheran World Federation, Nepal;
Distinguished Guests;

Ladies and Gentlemen:

It gives me a great pleasure to welcome you
all to this National meeting cum seminar
organised on IDNDR Day -1998.

We extend our sincere thanks to all of you
for kindly accepting our invitation to attend this
programme. We are particularly thankful to the
chief Guest, Honourable Minister of Home, and
Chairman of the IDNDR National Committee
Nepal, Mr. Govind Raj Joshi for your kindness
to be with us this morning, despite a busy
schedule.

As we all know, the UN General Assembly
in 1989 declared the decade of 1990-2000 as the
International Decade for Natural Disaster
Reduction, and the second Wednesday of October
every year as the IDNDR Day. Consequently, we
all are gathered here to observe the IDNDR Day
1998 today, 14th October 1998.

The Nepal Geological Society was one of
the first institutions in Nepal that took up the
IDNDR ideals and started working towards
achieving the Decade's goal. At the very
beginning of the Decade, it constituted a
permanent body within the Society: the NGS-
IDNDR Council to promote IDNDR message
within its members and outside. Since the start
of the Decade, the Society has been observing
the IDNDR DAY by organising such meetings
and seminars. It is our great pleasure that this
programme has received a national focus and
several governmental and non-governmental
organisations are involved in this programme.

The Nepal Geological Society has, over the
years, been working in close cooperation with
the IDNDR National Committee in fulfilling the
goals of IDNDR.

The UN theme for the IDNDR Day this
year is "DISASTER PREVENTION AND
THE MEDIA: PREVENTION BEGINS
WITH INFORMATION". Indeed this
particular theme is very much relevant and it
largely signifies the role of media to sort out
the ways in improving its role in the overall
task of disaster management from mitigation
and preparedness before a disaster event to
rescue and relief, and rehabilitation and
reconstruction after the disaster.

Keeping in view the UN theme, the Nepal
National Committee for IDNDR has organised
several activities including a 3-day Training
Programme on Disaster Journalism to the media
people, publication of awareness-raising poster
for wider distribution, and observance of the
IDNDR DAY today by organizing this meeting
which will be followed on by a technical seminar
on the same theme.

In three technical sessions of the seminar,
experts from different fields and disaster
managers will present specialised papers on
various aspects of natural disasters and the
disaster management capabilities developed in
the country. I invite you all to take active
participation in the seminar to build up a
consensus on our achievements in the past and
the efforts to be made in the coming years.

I do hope that the seminar will pave the way
for looking at and mitigating natural disaster in
a wider framework by bringing together all the
concerned professionals in a common platform.

We look forward to listening to you,
honoured guests, in this meeting, and are
confident that we will be receiving valuable
guidance and directions for us to follow for a
better management of disaster reduction activities
in the country in times to come.

Once again, I extend a very warm welcome
to you all, and thank you very much for your
kind attention.

Thank You.

Speech by the Chief Guest Hon. Minister of Home, Mr. Govind Raj Joshi

**Mr. Chairman,
Distinguished Guests,
Ladies and Gentlemen:**

I thank you very much for your invitation to participate in and inaugurate this important meeting. I am thankful also for the opportunity provided for sharing my views with you.

Today we all are meeting here to observe the IDNDR Day 1998. Nepal is a signatory to the UN Resolution to observe the International Decade for Natural Disaster Reduction 1990-2000. At the beginning of the Decade, Nepal constituted the Nepal National Committee for IDNDR. Since its inception this Committee has provided policy level recommendations to the Government for undertaking activities directed towards mitigation of natural and other disasters in Nepal. It is a pleasure to note that the Nepal Geological Society also started working in aspects of natural disaster reduction since the start of the Decade. Therefore, subsequently this organisation has been included as a member of the IDNDR National Committee of Nepal together with other professional societies of Nepal.

The IDNDR concept has been developing wider roots in Nepal with each year. The IDNDR concept focuses on bringing about a shift of emphasis from post-disaster actions to pre-disaster activities and capability enhancement in disaster mitigation and preparedness. This entails coordination of efforts and development of synergy among various organisations and institutions, government, academic, private and professional, in the use of available knowledge and technology for reducing the impacts of the disasters. This requires, in the context of Nepal, undertaking a massive work in areas of awareness raising on the possibilities of disaster prevention and impact reduction.

While there are several governmental and academic institutions, which carry out different works related with the whole cycle of disaster management in the country, it is wonderful that

professional societies such as the Nepal Geological Society, have been contributing significantly in the task of awareness raising in the country. I am happy to know that the Nepal Geological Society has formed a special group: the IDNDR Council of the Society, to promote the concept, to educate its members and other professionals and to mobilise all possible resources to propagate the IDNDR ideals. This Society has been working in close cooperation with the National Committee and the Home Ministry, and has made a tradition to observe the IDNDR Day by organising such meeting and Technical Seminar.

This year, several activities are being organised in Nepal under the National Program to observe the IDNDR Day. The IDNDR National Committee prepared the programme. Today's meeting and the seminar are a part of the National Program. In this context, the Home Ministry is glad to be providing assistance and collaboration in the organisation of this Meeting.

In Nepal, we face several types of natural hazards such as snow/ice avalanches and GLOF in the Higher Himalayas, fire and floods in the Terai, landslides in the mountainous areas, and earthquakes throughout the country. There are also the problems of storms, hailstorms, and epidemics. Every year the country is affected by one or more types of disaster in this or that part. Disaster management is actually an immense task in Nepal. The government has endorsed the National Action Plan prepared by the Nepal National Committee on IDNDR. This comprehensive plan has identified the main actions necessary to be undertaken for effectively reducing the risk from disasters. But the government alone cannot do an effective disaster management, and it requires efforts from all section of the society. While the government is doing its best to improve the national capability in disaster management, to provide rescue and relief to the disaster victims, it is necessary that all the interested organisations, especially the

private sector and the professional societies, should look into the National Action Plan, and take up actions as per their institutional capability.

We feel that awareness raising on the national scale on the possibilities of disaster and risk reduction is one of the tasks, which needs serious attention in the country. Here the media can contribute much in educating the people on various aspects of disaster management, both before the disaster event and after the event.

Such importance of the media in disaster reduction has been recognised internationally. This is reflected in the UN selecting "DISASTER PREVENTION AND THE MEDIA: PREVENTION BEGINS WITH INFORMATION" as the theme for the IDNDR Day 1998. I am happy to note that the national programme for the IDNDR Day included a 3-day training programme on Disaster Journalism, which has been organised for the first time in Nepal. I hope that such training programme become a regular activity not only in Kathmandu but also in other areas of the country. Information

of the efforts to cope with disaster, preparedness and ways of reducing the disaster impacts, the possibilities of personal and collective safety should reach to the common man who suffers the most from the disasters.

I am glad to know that this IDNDR Celebration Programmes includes this ceremonial part as well as more technical parts where the scientists, engineers, doctors and technologists will share their experiences and research findings, and representatives of the media will elaborate on the problems and prospects of information dissemination and communication for disaster prevention and reduction. I am sure that the meeting as well as the deliberations of seminar will seriously discuss related matters and come up with solutions as well as consensus on the implementation of the solutions for disaster reduction in the country. The government will listen to the views of the specialists and implement the pertinent recommendations.

Thank you all again.

*Best Wishes and
Hearty Felicitations to*
the Nepal Geological Society



MASINA CONTINENTAL ASSOCIATES (P.) LTD.

We provide services in
Civil • Geotech • Surveying • etc.

P O Box 2995, Baneshwor, Kathmandu, Nepal, Telephone 473163, Fax 977 1 248083

Speech by Mr. Amod Mani Dixit, Coordinator, IDNDR Council, Nepal Geological Society

Respected Mr. Chairman,
Honourable Chief Guest,
Distinguished Guests,
Ladies and Gentlemen,
Dear Colleagues:

We extend our sincere thanks to you all for sparing your valuable time to attend this important meeting devoted to propagating the ideals of IDNDR; to review collectively our efforts towards mitigation of natural disasters in Nepal; to explore further the opportunities to improve the national capabilities in Disaster Management; and to join hands with numerous initiatives being undertaken currently worldwide.

There has been established a tradition of different institutions in Nepal observing the IDNDR Day as per a national programme prepared by the Nepal National Committee for IDNDR, which includes within its members also professional societies. We feel that the leading role of the National Committee has been conducive towards observing this day in a befitting manner. Today IDNDR Day programmes are being organised in all of the district headquarters. Awareness-raising posters have been designed, printed and ready for wider distribution. A three-day training programme on the role of media in disaster management was completed successfully in which 25 journalists from various government and private media received knowledge on various disasters faced by the country and discussed the potential contribution of the media in various stages of disaster management from mitigation and preparedness to post-event rehabilitation and reconstruction. Most of these programmes in Kathmandu have been organised by the joint efforts of two professional societies with understanding, support and encouragement from different ministries, WESC, DPTC, UNDP, Lutheran World Federation, Rastriya Beema Sansthan, and several others. We express our thanks to them.

However, the IDNDR activities in Nepal are not limited to this day alone. Guided generally by the National Action Plan on Disaster Management, which was prepared by the

National Committee and endorsed by HMG, several governmental as well as non-governmental institutions have been conducting various activities. The Department of Mines and Geology continued the researches in seismology and environmental geology leading to the formation of hazard maps. DHM and WECS made studies in GLOF and gained experiences in methods of early warning and preparing the population against possible disaster. Non-traditional activities include formation of the Disaster Management Unit within the Kathmandu Metropolis, and keen interest shown and efforts made by other municipalities towards the establishment of disaster units in the near future. Formulation of the Building Council Act was probably a milestone for the last year. IDNDR-related activities include participation of Kathmandu Valley as Associate City in the UN RADIUS project; and in the UN IDNDR Project Understanding Urban Seismic Risk Around the World as a Member City with the Kathmandu Metropolis and the NSET-Nepal serving as contact points jointly, conduction of the Kathmandu Valley Earthquake Risk Management Project by NSET/GeoHazards International under AUDMP of the Asian Disaster Preparedness Centre. Many institutions for example UMN and LWF are conducting Disaster Preparedness programmes and undertaking awareness raising activities traditional as well as innovative means such as street drama and FM broadcasts.

There are many other initiatives taken by different organisations. No doubt, that institutionalisation of disaster prevention and management is taking roots in Nepal.

However, these are still not enough. There are so many activities required for improving our national capability in disaster prevention and management. Some of these may require implementation of costly projects, but there could be so many activities, which are not costly, but still they could significantly reduce the risk. Formation disaster management/response plans for individual institutions with a priori assignment of responsibilities during a disaster

formation of disaster management committees at municipal ward or VDC level, regular drills at school and institutions, etc. are extremely effective low or no-cost activities. These need to be undertaken and implemented. I do not think these activities demand any external assistance or loans from financial institutions.

More costly of the disaster prevention and mitigation measures could be implemented by integrating these with the ongoing development activities. For example, procurement and establishment of strong motion seismograph arrays should be linked with hydropower development projects. Such arrays are regarded necessary for a better definition of the seismic wave propagation pattern, so that the risk factor could appropriately be defined and incorporated into the design itself.

Many more other actions need to be implemented now. Obvious lack of resources demand that there should be consensus in the prioritisation and selection. Further, it is absolutely necessary to develop a synergy of available resources and institutions: government, non-government as well as private. We believe that the Nepal National Committee for IDNDR has already inculcated such approach. It only needs to be expanded to incorporate more and more institutions.

I want to point to some of the more important tasks that need to be addressed on an urgent basis. The first could probably be the constitution of the Building Council and enactment of regulations that could pave way for the implementation of the National Building Code. We all know that implementation of the building code is a long-term process and the results would be obvious only after a certain period. Hence, we can not afford to wait any longer to set off the process.

IDNDR has been very helpful for Nepal. The concept has helped the country and her population to develop confidence on the possibilities of mitigation and prevention, to make a shift from fatalism to active participation in disaster preparedness. As a landlocked country, Nepal has received special attention from IDNDR and the UN system.

However, the IDNDR Decade will be ending in slightly over a year's time. Considerable dialogue is going on internationally as to the continuation of the IDNDR concept and activities into the next millennium. I understand that the final IDNDR world conference is planned for in the near future. It is our duty to initiate a serious dialogue, and build up a national consensus to conclude on the best form and content of the continuation of IDNDR for a country like Nepal. Only then, we could make any significant proposition to the UN in the next conference.

I remember that one of the lessons learnt from the 1988 earthquake was the recognition of the extremely important role of communication and the necessity of establishing communication system especially in rural and remote areas. Another lesson learnt was the necessity of imparting training on disaster management to the media so that they are capacitated to play the extremely positive role by proper reporting to reduce the panic and to improve the relief works.

We learnt it from a real disaster ten years ago. That is why we fully understand the value of the UN selecting "DISASTER PREVENTION AND THE MEDIA: PREVENTION BEGINS WITH INFORMATION" as the theme for the IDNDR Day 1998. The theme is quite relevant, especially in countries like ours, where access to information is somewhat difficult. For effective Disaster Management, both the facts and the plans to cope with disasters should be easily available to all: the managers as well as the potential victims. Disaster management is in a sense, an effective information management. This year, especially during the past weeks, we heard much about the role of media in disaster management, from bringing in the facts and plans to the needful to the full utilisation of the different forms of media in reducing the panic following a disaster. So, there may be little to add to this. However, I would like to stress the importance of one particular form of media- the Internet and e-mail, in effective information management. We know that it is very costly in Nepal yet. Still we should very seriously think in making this media, with its endless potential, accessible as wide as possible.

Thank you all again.

Speech by the Chairman Mr. Padma Prasad Pokhrel, Secretary, Ministry of Home

Honourable Chief Guest, Minister of Home Mr Govind Raj Joshi,
Distinguished Guests,
Ladies and Gentlemen,

It is a privilege for me to be invited to this important meeting organised to observe the International Day for Natural Disaster Reduction and given the responsibility to chair the Inaugural Session.

This year, the IDNDR Day is being observed under the Theme of "Disaster Prevention and the Media: Prevention begins with Information".

This meeting is being organised as one of the events of the National Programme for the IDNDR Day as decided by the Nepal National Committee for IDNDR. The IDNDR Day programme includes several activities such as Radio Message from the Honourable Home Minister who is also the Chairman of the Nepal IDNDR Committee, Organisation of a 3-days training programme of Disaster Journalism, publication and distribution of a poster on Disaster Prevention and Risk Reduction, and this National Meeting and Technical Seminar on "Disaster Prevention and the Media: Prevention begins with Information". Different organisations are involved in the conduction of the various activities.

This Meeting and the Technical Seminar is being organised by the Nepal Geological Society in collaboration with different institutions. Actually, this has become a tradition of the Nepal Geological Society to organise such a seminar every year on the IDNDR Day. The Nepal Geological Society should be thanked for this as this seminar has brought in participants from various fields: science, engineering, media and management, from academia, government, private, and public institutions. Such seminars every year focus on the particular theme proposed by the UN IDNDR Headquarters for that year. This year, the theme puts an emphasis on the role of Media and information dissemination in the task of Disaster prevention and Reduction. Accordingly, the seminar this year is focusing especially on exploring the prospects for better

defining the role of the media in the Nepalese context and to sort out ways to improve its role in the overall task of disaster reduction and management: in mitigation and preparedness, during rescue and relief periods and also during rehabilitation and reconstruction efforts.

We have listened to the views expressed here on aspects of disaster management in Nepal. It is quite clear that there is a continual enhancement of the national capability in disaster management. Different organisations: governmental, semi-governmental, non-governmental, private and professional, have been contributing much in improving the national capabilities. Researches are being made, hazard maps are being prepared for different disasters, and ways are being identified for individual and collective safety during and after disasters. Awareness raising materials are being created for educating the general mass. But all these efforts and their deliberations will be useful only if the information, the knowledge and the results of researches could be brought to the reach of the common man, to the potential victims, to the nook and corner of the country. Here lies the role of the media. The media can help reduce the panic following a disaster by ensuring an effective flow of information. It can assist the disaster actors in a better organisation of rescue and relief works by informing and guiding the public about the response activities being carried out. It can assist the disaster relief committees by informing objectively the limitations and constraints of the relief and rehabilitation activities that generally are done on a crisis management basis.

It is wonderful that this meeting has brought together representatives of the media together with specialists from various fields. I do hope that the deliberations of the Seminar will discuss the related issues and help to better define the roles of the different sectors in disaster management.

I thank the organisers again for giving this opportunity to be with you and share some of my feelings.

Thank You.

Best Wishes for Grand Success of
**International Symposium on
Engineering Geology, Hydrogeology and
Natural Disaster with Emphasis on Asia**

Kathmandu, Nepal, Sept. 28-30, 1999

Organised by

Nepal Geological Society

HIMALAYAN SHERPA COAL UDDYOG

Ghorahi, Dang 082-60237

Kathmandu, 422255

*We Exploite and Supply Coal Suitable for:
Brick and Tile Industries, Cement Industries etc.*

Manokamana Coal Industries (Pvt.) Ltd.

Wishes Grand Success for
**International Symposium on
Engineering Geology, Hydrogeology and
Natural Disaster with Emphasis on Asia**

Kathmandu, Nepal, Sept. 28-30, 1999

Organised by

Nepal Geological Society

**We produce and supply coal suitable for:
Brick and Tile Industries, Cement Industries etc.**

Contact Address:

Ghorahi, Dang: 082-60419

Kathmandu: 472094

Speech delivered by Mr. M. Okamoto, Adviser, DPTC

Mr. Chairman,
Honourable Minister, Mr. Govind Raj Joshi,
Distinguished Representatives,
Ladies and Gentlemen:

It is a great pleasure for me to have the opportunity to say a few words.

I have been engaged in disaster prevention works, and when Japan suffered from Hanshin-Awaji earthquake damage in 1995. I was just the Chief of Disaster Prevention Section and also the Chief of IDNR of Ministry of Construction in Japan.

As you are aware, the destruction of forests in many parts of the world due to various reasons is resulting in sediment-related disasters which in turn destroy many lives and properties. This process is particularly remarkable in the developing countries, and the IDNDR was launched in 1990 to reduce natural disasters in these countries. As a proponent of the IDNR, Japan occupies an important position to take initiative in global disaster prevention as well as environmental issues.

On that line, Japan collaborated with Nepal in order to promote the mitigation of disasters through the activity of DPTC which was established in 1991. The establishment objective of DPTC is to strengthen capability of His Majesty's Government of Nepal to cope with water-induced disaster through technology development, provision of training and establishment of data base.

Japan has still suffered from a lot of disaster damage because of the severe natural conditions. And, the history of the development of modern Sabo techniques in Japan has reached 100 years since the introduction and integration of European Alps, Sabo techniques with more indigenous techniques against a background of a severe natural environment.

So, I would like to explain the Sabo works in Japan briefly. Please take a look at the paper, whose title is Sabo Works in Japan.

Around 150 years back in Edo era, this Sabo dam was constructed by local people with the help of Edo government. Its height is 13.3m and width is about 25m which is located in Hiroshima prefecture. This is made of stone and inside is gravel and sand. 150 years after its completion, it is still working well to protect the area from disasters. There are such stone dams in this area. It is important to be construct them by local people.

Meiji era, about 130 years back. With the ending of isolation policy after Meiji Restoration, Japan started to make dynamic strides towards becoming a modern nation by absorbing foreign technologies and cultures. In the field of Sabo engineering, the theories and technologies were gradually consolidated as imported ones, and were adopted.

Photo 2 shows the Sabo dam in Japan which was constructed in 1888 under the supervision of Drijke who was from the Netherlands and stayed for more than 30 years in Japan. It has a height of 6.8 m and a crown width and stone pitching width of 4 m and 2.1 m, respectively. This is located in Shiga prefecture.

The dam of Photo 3 was constructed between 1916 and 1918 to prevent degradation at a stage section downstream. Although the Netherlands technologies were considered the best at that time, this dam was designed based on a similar dam design for the Durance River in France which was given in an Austrian textbook on erosion control. This was brought back to Japan by a Japanese engineer who was sent to Europe on a study tour in 1911. Like this, the European Alps' Sabo was transferred to Japan and this time Japanese Alps' Sabo is transferred to Nepal, to the Himalayan Alps.

Photo 4 shows the hillside works. Once a mountain become bare, regeneration of vegetation is extremely difficult due to erosion of the surface soil by rainwater and freezing. This photo shows the process of revegetation in the Rokko Mountains from top to bottom. The Rokko Mountains are located in Kobe city that was affected by Hansin Awaji earthquake in 1995. Upper photo is 1 year after the completion. Middle photo is 5 years later, and lower Photo is of 1995. It took a lot of time for the vegetation to restore.

Figure 1 compares the disasters of 1938 and 1969 at the Rokko Mountains. The two great disasters were similar in terms of rainfall amounts and spatial distribution. In 1967, the urban areas stretched further towards the steep mountain sides than was the case in 1938, implying the potential for a greater disaster. However the reality was that the disaster in 1969 was much smaller than that in 1938, as Figure 1 shows. This proved the successful implementation of Sabo works. Before the disaster in 1967, 174 Sabo dams were completed, and these Sabo dams were effective. The bottom photo is the urban area in Kobe city expanding to the near

mountain side. The vegetation was restored artificially and 100 years were needed for its completion.

As I mentioned, in Japan, we call erosion and sediment control works "Sabo" "Sa" of "Sabo" means debris, and "Bo" means prevention. Today, we developed Sabo technology to cope with

volcanic mud flows, landslides, slope failure and snow avalanches and transfer to worldwide countries including Nepal.

We are going to promote Sabo technological development with your collaboration and help and aim at a safe world free from sediment related disasters.

Thank you very much.

Vote of Thanks by U.B. Shrestha, Secretary, Nepal Geological Society

Respected Chairman,
Honourable Chief Guest,
Respected Senior Government Officials of HMG/Nepal,
Distinguished Guests and Participants,
Dear Fellow Members of the Society,
Ladies and Gentlemen:

On behalf of the Nepal Geological Society, I am privileged to thank you all the distinguished guests and the participants in this National Meeting cum Seminar on "Disaster Prevention and the Media: Prevention Begins with Information".

I am very much grateful to our Chief Guest, Honourable Minister Govinda Raj Joshi, Ministry of Home and Chairman of the IDNDR National Committee, Nepal for sparing valuable time to inaugurate this National Meeting cum Seminar and for the valuable address. I also thank Honourable Minister for being kind to distribute the certificates to the participants of the "Disaster Journalism". The Nepal Geological Society has always received strong cooperation and support from the IDNDR National Committee, Nepal to observe this IDNDR-Day. The Society extends its sincere thanks to the IDNDR National Committee, Nepal, for their support and cooperation to organise today's programme.

The Society also would like to express its gratitude and thanks to Mr. Padam Prasad Pokhrel, Secretary, Ministry of Home, for chairing this Inaugural Session despite his very busy schedule. The speech is highly appreciable in the context of awareness and prevention of the natural disaster.

I thank Mr. G.S. Thapa, Director General of the Department of Mines and Geology for his notable speech and continued support to the society by providing logistic and other necessary helps. The Department of Mines and Geology has always been supporting the Society by providing all kinds of help at the time of the Society's necessity. The Society would like to express sincere appreciation and acknowledgement to the Department of Mines and Geology.

I thank Madame Shanta Laxmi Shrestha, Deputy Representative, Lutheran World Federation, Nepal for the important message

Lutheran World Federation has provided collaborative support and financial help to observe this IDNDR - Day. The Society would like to express sincere appreciation to the Lutheran World Federation, Nepal.

I thank Mr. Masao Okamoto, the Chief Advisor, Water Induced Disaster Prevention Technical Centre (DPTC) for his important speech. DPTC has always been helping the Nepal Geological Society with strong cooperation and financial contribution to organise this IDNDR-Day. The Society would like to express sincere acknowledgement to DPTC.

The Society likes to extend its sincere gratitude and thanks to Mr. William S. Berger, Co-ordinator, Disaster Management Secretariat, UNDP/Nepal for being with us, the notable address and the financial support. Sashakawa Award of UN IDNDR should it be awarded, NGS will definitely use the cash for the establishment of disaster information system as suggested by Mr. William Berger.

I thank Mr. Amod Mani Dixit, Coordinator, IDNDR-Council, the Nepal Geological Society for the remarkable speech. I also thank National Society for Earthquake Technology (NSET)/Nepal in collaborating today's IDNDR programme with the Nepal Geological Society.

The Nepal Geological Society would also like to extend its sincere gratitude to all the high officials of His Majesty's Government of Nepal, distinguished guests, journalists and other distinguished personalities for being with us in this ceremony.

Great deal of thanks to all the members of the Nepal Geological Society for their continued cooperation and support in organising today's programme.

Our sincere thanks are also due to the Russian Centre of Science and Culture for providing this venue for today's meeting.

We offer our sincere apologies for any inconveniences that may have arisen during the organisation of this programme.

Once again thank you, thank you all.

ABSTRACTS AND PAPERS PRESENTED IN THE TECHNICAL SESSIONS OF THE SEMINAR ON NATURAL DISASTER PREVENTION AND THE MEDIA: PREVENTION BEGINS WITH INFORMATION

The Nepal Geological Society organised the one-day technical seminar on IDNDR on 14th of October, 1998, in Kathmandu in collaboration with National Society for Earthquake Technology-Nepal; IDNDR National Committee Nepal, Water Induced Disaster Prevention Technical Centre, UNDP Nepal, and Lutheran World Federation Nepal. The abstracts and full papers presented in the technical session were the following.

Environmental Geological Assessment of New Settlement Areas and Various Types of Infrastructure in Kathmandu Valley

K.P. Kaphle

Senior Divisional Geologist

Department of Mines and Geology, Lainchaur, Kathmandu, Nepal

ABSTRACT

There is an alarming situation of environmental degradation in the Kathmandu Valley. Migration of people from outside to Kathmandu valley and uncontrolled expansion of the urban areas without proper infrastructure is the root cause of environmental pollution. The main sources of pollution are unplanned urbanisation, uncontrolled waste disposal, haphazard exploitation of natural resources, improper locations of industries, brick, carpet and garment factories and stone crushing plants and degradation of fertile land. All are induced by human activities. River / surface water pollution is mainly due to direct connection of sewerage pipes and industrial effluents to the river, haphazard river side dumping of municipal and industrial waste. Similarly, ground water is contaminated due to chemical waste and harmful bacteria. Air pollution is due to heavy traffic in the narrow street, poor condition of the vehicles and poor quality of the fuel. Therefore, urban inhabitants in the valley are facing acute problems of pollution causing frequent outbreak of epidemics and health hazards.

Kathmandu Valley Town Development Committee (KVTDC) has selected 27 new

settlement areas for development in Kathmandu Valley. It has planned to provide complete infrastructure and other basic facilities to the people residing there. These Development activities are in different stages of implementation under Land Readjustment Projects that include mainly Land Pooling Scheme (LPS), Guided Land Development (GLD) Program and only few of them were selected under Housing Development Project (HDP), the Area Town Development (ATD) project and Municipal Infrastructure Development Project (MIDP) programmes.

The author has made environmental geological assessment of most of these areas and other development activities in the valley, recently. It is tried to identify various geo-environmental problems in each area and suitable preventive measures are recommended to solve these problems. The paper includes various types of information / data on new infrastructure development plan especially, new settlement areas in Kathmandu Valley. Information on proposed second (outer) ring road, river water quality (pollution) and bearing capacity of the ground, liquefaction hazard and flood hazard in Kathmandu Valley are also incorporated in the paper.

*Best Wishes and
Hearty Felicitations
on
the Auspicious Occasion
of*

*International Symposium on
Engineering Geology, Hydrogeology and Natural Disaster
with Emphasis on Asia
Kathmandu, Nepal, Sept. 28-30, 1999*

UDAYAPUR CEMENT INDUSTRIES LIMITED

Head Office:
Jaljale, Udayapur, Nepal
Phone: (035) 20300

Branch Office:
Gaushala, Kathmandu
Ph. 473030, 486070
Fax: 486606

Always use the Udayapur Cement's Product
"Gainda Chhap Cement"
For Quality and Strength

दैवी प्रकोप व्यवस्थापन - कार्यनीति

डा. मीन बहादुर पौड्याल क्षेत्री

गृह मन्त्रालय

सारांश

यस कार्यपत्रमा नेपालको दैवी प्रकोप व्यवस्थापनको स्वरूप प्रस्तुत गर्नुका साथै दैवी प्रकोप व्यवस्थापनमा देखा परेका समस्याहरू र ती समस्याहरूको समाधानका उपायहरू पहिल्याउने प्रयास गरिएको छ। नेपालको दैवी प्रकोप व्यवस्थापनका समस्याहरूमा दैवी प्रकोप व्यवस्थापनसँग सम्बन्धित निकायहरू बीच समन्वयको अभाव, ती निकायहरूको कार्य र उत्तरदायित्वको कितान नहुनु, पर्याप्त बजेट नहुनु, तथ्यांक संकलन र सो को विश्लेषण प्रभावकारी नहुनु, दैवी प्रकोपका दृष्टिकोणले संवेदनशील क्षेत्रहरूको पहिचानका साथै नक्साकन नहुनु, पूर्व चेतावनीको प्रविधि अझै अविर्कसित र अपर्याप्त अवस्थामा रहनु र जनचेतनाको काम नै मुख्य रूपमा देखा परेका छन्।

उपर्युक्त समस्याहरू समाधानका लागि विद्यमान दैवी प्रकोप उद्धार ऐन, २०३९ लाई समय सापेक्ष बनाउन संशोधन गर्नु आवश्यक देखिएको छ र सो ऐनमा दैवी प्रकोप व्यवस्थापनसँग सम्बन्धित विभिन्न निकायहरूको

कार्य र उत्तरदायित्व स्पष्टमँग कितान गर्नु पर्दछ। विद्यालयको पाठ्यक्रममा दैवी प्रकोप व्यवस्थापन समावेश गरिनु पर्दछ। नेपालको कूल जनसंख्याको ४० प्रतिशतले मात्र लेखपढ गर्न सक्ने र बाँकि ६० प्रतिशत निरक्षर भएकाले विद्यालयका शिक्षक, विद्यार्थीहरू, महिला कार्यकर्ताहरू, स्वास्थ्यकर्मीहरू र समाजसेवीहरू समेतलाई दैवी प्रकोप व्यवस्थापन सम्बन्धी जानकारी एवं तालिम दिनु पर्दछ ता कि उनीहरूले जनसमुदायमा गई व्यापक रूपमा जनचेतना जगाउन सकून्। त्यस्तै, तथ्यांक संकलन, तथ्यांकको प्रक्षेपण, दैवी प्रकोपका दृष्टिकोणले संवेदनशील क्षेत्रहरूको नक्साकन आदि र पूर्व चेतावनी प्रणालीलाई प्रभावकारी बनाउन विद्यमान प्रविधिहरू विकसित गर्ने अत्यावश्यक छ जसको लागि तालीम प्राप्त कुशल जनशक्ति र पर्याप्त बजेटको आवश्यक पर्दछ।

उल्लेखित समस्याहरूका बावजुद श्री ५ को सरकारले आफ्नो सीमित साधन, स्रोतबाट दैवी प्रकोप रोकथाम, न्यूनीकरण र प्रकोप पीडितहरूलाई तत्काल राहत दिने, उद्धार गर्ने तथा पुनर्स्थापना गर्ने समेत कार्य गरिराएको छ।

Disaster Management Plan for Hospitals

Dr. R. P. Shrestha, M.D. MS, FICS

Sr. Consultant Surgeon

ABSTRACT

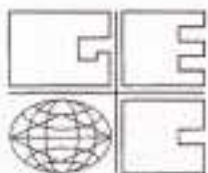
Any disaster, whatever may be the cause, results in health related concerns, therefore a disaster management will never be effective unless the health institutions are prepared to face it.

In relation to their medical management in a health institution, disaster should be defined as "Situation of sudden influx of mass casualties into the emergency room (ER) within a short notice of time (or even without a prior notice).

Various components of a disaster planning are to be considered while making a plan. They are:

1. Disaster committee
2. Declaring the disaster

3. Information dissemination and manpower mobilisation
4. Case receiving to triage
5. Categorising the cases
6. Diagnostic areas
7. Case flow pattern
8. Support services
9. Disaster ward
10. Supplies and store
11. Administrative support
12. Inter-institutional coordination
13. Morgue
14. Mock exercise / drill



GEOCE CONSULTANTS (P) LTD.

CONSULTING ENGINEERS

G.P.O. BOX: 4266, KATHMANDU, NEPAL, TEL: 528370, 521175

FAX: 977-1-526096, E-Mail: geoce@wlink.com.np

We provide quality service in the multi-disciplinary spheres:

-  **Engineering**
-  **Agriculture**
-  **Forestry**
-  **Environment**
-  **Rural Areas**

Range of Services Include:

- sector studies
- development planning
- project identification
- project planning and preparation
- feasibility studies
- detailed design
- construction supervision
- project management
- technical assistance
- project monitoring and evaluation
- project operation and maintenance
- institution strengthening and human resource development

15. 'Site disaster activities'

One may never be able to prevent a disaster but a well-thought plan would surely minimize further loss of life and damage to health condition.

Disaster may not strike twice in the identical way but the lessons learnt from one disaster can be applied more successfully to another situation with better results.

प्रकोप व्यवस्थापनमा पत्रकारिताको भूमिका Role of Media in Disaster Management

धीरामसिंह बस्नेत, आनंद मणि दीक्षित, आपन टक्कर, महेश नकमी, लजरा द्वेनी, शिवबहादुर प्रधानरा

विषय प्रवेश

सामान्यतया पत्रकारिता भन्नाले आम जनतालाई पत्र - पत्रिका र श्रव्य- दृश्य संचार माध्यमबाट विभिन्न विषयको जानकारी दिनु भन्ने बुझिन्छ । तर पत्रकारिताको गहनता र गरिमा यतिमा मात्र सीमित छैन । वास्तवमा पत्रकारिताको सबै भन्दा महत्वपूर्ण र पवित्र पक्ष नै आवाज विहीनहरूको आवाज (Voice of the Voiceless) बन्न सक्नुमा छ । आवाज विहीनहरू भन्नाले हाम्रो समाजमा रहेका विपन्न वर्ग, बाल-बालिका, अन्धा, अपाङ्ग, शोषित, पीडित र मानवको नैसर्गिक अधिकारबाट वञ्चित निमुखा वर्ग भन्ने बुझिन्छ । यिनै निमुखा वर्गको आवाज बनेर सरकार, अन्तर्राष्ट्रिय समुदाय र सम्बन्धित सबै निकायलाई ती निमुखा वर्ग प्रति उनीहरूको दायित्व तर्फ सचेत गराउनु नै वास्तविक पत्रकारिता हो ।

प्रकोपको सन्दर्भमा "आवाज विहीनहरू" भन्नाले मज्झिका पुल, जीर्ण अवस्थामा रहेका ऐतिहासिक स्मारकहरू, पृथ्वीको गर्भमित्र हुने हलचल, प्राकृतिक उतार-चढाउ, तफाचोरी प्रुस्त सार्वजनिक निर्माण आदि पर्दछन् । यिनीहरूको मौन आवाजलाई पत्रकारिताको माध्यमबाट मुखरित नगरिएमा ठूला- ठूला प्रकोप हुन सक्छन्, जसबाट हृदयविदारक वियोग र अपार जनधनको क्षति हुन सक्दछ । सानो उदाहरण लिइ हेरौं - धेरै चल्तीको बाटोमा रहेको एउटा पुल मज्झि गएको छ । त्यो पुल आफै आफ्नो दयनीय अवस्थाबारे आवाज उठाउन सक्दैन । तर कुनै पत्रकारको आँखा त्यस पुलको अवस्थामा पर्थो र उसले त्यसबारे लेखिदियो भने सम्बन्धित क्षेत्रको ध्यान आकृष्ट हुन्छ र त्यसको मर्मत सम्भार वा अन्य वैकल्पिक व्यवस्था हुन सक्छ । जसबाट पुल भत्किएर हुन सक्ने सम्भावित ठूलो दुर्घटनाबाट दर्जनौ मानिसको जीवन जोगाउन सकिन्छ ।

विकास पत्रकारिता (Development Journalism) आजको आधुनिक पत्रकारिताको एक महत्वपूर्ण पक्ष हो । प्रकोप पत्रकारिता (Disaster Journalism) लाई विकास पत्रकारिताकै एक अभिन्न अंगको रूपमा लिन सकिन्छ । किनकि एक शताब्दि लगाएर कुनै देश वा समाजले गरेको विकास एक निमेषको प्रकोपमै धराशायी हुन सक्छ । त्यसैले

समयमै पूर्व सावधानीका उपायहरू अवलम्बन गरी त्यस्तो विभत्स अति हुनबाट बचाउन पत्रकारिता जगतले समाजको तल्लो तप्का (Grass Root Level) देखि नीति निर्माता तह (Decision Making level) सम्मलाई घुम्नुपर्छ, अभिप्रेरित गर्ने र सचेत गराउनमा निर्णायक भूमिका खेल्न सक्छ । विकास कार्य प्रति चामो राख्ने हरेक पत्रकारका लागि प्रकोप एक उत्पन्न सरोकारको विषय हो । तसर्थ प्रकोप पत्रकारिता विना विकास पत्रकारिताको अवधारणा अधुरो हुन जान्छ ।

यसका अतिरिक्त आम जनता र सरकार वा सम्बन्धित निकायको बीचमा पुलको रूपमा रही पत्रकारिता क्षेत्रले अन्य सन्दर्भमा पनि जनताका चाहना सरकार समक्ष र सरकारका धारणा जनता समक्ष पुर्‍याउने व्यावसायिक दायित्व निर्वाह गरिरहेकै हुन्छ ।

प्रकोप व्यवस्थापन

प्रारम्भमा प्रकोप र प्रकोप व्यवस्थापनबारे मानिसहरूमा ज्ञान र प्रविधिको अभाव थियो । त्यसैले प्रकोपलाई "दैवको लीला" भनेर हामीहरू निरुपाय जस्तै भई बस्थौ । तर वर्तमान उपलब्ध ज्ञान, विज्ञान, प्रविधि र मानिसको इच्छा शक्तिले धेरै परिवर्तन ल्याइदिएको छ । जसको फलस्वरूप प्रकोप व्यवस्थापन, न्यूनीकरण, पूर्व तयारी आदिका क्षेत्रमा नयाँ-नयाँ ढोकाहरू उघारिएका छन् । प्रकोपलाई मानिसले पूर्णतया आफ्नो नियन्त्रणमा लिन नसके पनि प्रबल इच्छा शक्ति राखेर दुइ जठोटका साथ एक जुट भई काम गर्ने हो भने प्रकोपबाट हुन सक्ने जन धनको अपार क्षतिलाई धेरै हदसम्म घटाउन सकिन्छ भन्ने तथ्य अब सावित भई सकेको छ । घरन उठ्छ के हामी त्यसो गर्न सक्षम छौं त ? विकसित देशहरूले प्रकोप व्यवस्थापनका क्षेत्रमा ज्ञान र प्रविधिको विकास गरी धेरै उपलब्धी र सफलता हातिल गरिसकेका छन् । ती ज्ञान र प्रविधिलाई हाम्रो जस्तो विकासशील देशहरूमा क्रमसँग स्थानान्तरण गर्ने सकिएमा हाम्रो समाजमा पनि प्रकोपको कारण हुने धेरै परिवारको विषमतालाई घटाउन सकिन्छ भन्ने कुरामा कुनै शंका छैन । यही विश्वासको जगमा नै प्राकृतिक प्रकोप न्यूनीकरण अन्तर्राष्ट्रिय दशक (IDNDR) उभिएको छ । तर हाम्रो जस्तो अल्प विकसित राष्ट्रमा यो विश्वासलाई मूर्तरूप

**We are proud to inform that
we are capable of getting and successfully
producing**

**Semiprecious Gemstones from the
Higher Himalayan Range of Nepal**
(Beryl, Tourmaline, Corundum, Garnet and Quartz etc.)

Besides this, we are also able to produce coesite quartz, crystal quartz, ceramics clay, silica sand (more than 99.5% silica) etc.
in large scales.

Mine Owner, Wholesaler and Exporter:

(Specialised in Quartz Crystal and Cluster in NEPAL)

Himali Gems Industry (Pvt.) Ltd.

Lapidary Centre (P.) Ltd.

Himalayan Gem, Nepal

Show Room

Thamel, Kathmandu (Behind Hotel Malla)

Tel: Kathmandu - 423329

Dharan - 22928

Fax: 977-1-414184

E-mail: Shangrilatreks@hons.com.np

दिन त्यति सजिलो छैन । त्यसका केही मूलभूत कारणहरू यस प्रकार छन्-

- क) आफ्नो बाहुबलमा भन्दा भाव्यमा निर्भर गर्ने हाथो सामाजिक परिपाटी
- ख) विकसित ज्ञान र प्रविधिसम्म पहुँचको अभाव
- ग) नयाँ ज्ञान र प्रविधिलाई स्वीकार गरी कार्यान्वयन गर्न उत्सुक हुने जन चेतनाको स्तरमा न्यूनता
- घ) त्यस्ता ज्ञान र प्रविधिलाई अपनाउन आवश्यक पर्ने स्रोत र पूर्वाधारहरूको अभाव
- ङ) राज्यले निर्धारण गर्नु पर्ने प्राथमिकता क्षेत्रको निक्कैलमा अन्तर्गत
- च) सैद्धान्तिक रूपमा निर्धारित उद्देश्यहरू हासिल गर्नलाई चाहिने राजनीतिक इच्छा शक्ति र व्यावसायिक प्रतिबद्धताको खाँचो ।

विकासशील र अन्य विकसित राष्ट्रहरूले अन्य क्षेत्रमा जस्तै प्रकोप नियन्त्रण एवं व्यवस्थापन क्षेत्रमा पनि माथि उल्लेखित अवरोधहरूलाई सकेसम्म पन्छाउनु IDNDR ले गत करीव एक दशक देखि अनवरत प्रयत्न गरिरहेको छ । यस प्रयत्नको फलस्वरूप प्रकोप व्यवस्थापनका क्षेत्रमा आशा र उत्साहका केही सकारात्मक संकेतहरू देखा परेका छन् । नेपालकै सन्दर्भमा भन्ने हो भने श्री ५ को सरकारले निर्धारण गरेको दैवी प्रकोप नियन्त्रण कार्य नीति, भवन संहिता विधेयक, नेपाल भौगर्भिक समाज, भूकम्प प्रविधि राष्ट्रिय समाज- नेपाल जस्ता गैर सरकारी संस्थाहरूको सक्रियतामा काठमाडौँ उपत्यका भूकम्पीय जोखिम व्यवस्थापन आयोजनाको कार्यान्वयन, काठमाडौँ महानगरपालिकामा प्रकोप व्यवस्थापन इकाईको स्थापना, उपत्यकाका नगर क्षेत्रहरूमा वडा स्तरमा समेत जनस्तरबाटै प्रकोप व्यवस्थापन समितिहरूको स्थापना, पत्रकारिता तालीममा प्रकोप पत्रकारिता विषय समावेश, प्रकोप सम्बन्धी तालीममा पत्रकार, शिक्षक, समाज सेवी महिला आदिमा बढ्दो अभिरुचि, सेना, प्रहरी, चिकित्सक लगायत विभिन्न व्यावसायिक संस्था तथा व्यक्तिहरूमा प्रकोप व्यवस्थापन प्रति बढ्दो चासो, पत्रपत्रिकाहरूमा प्रकोपका विभिन्न पक्षबारे हान देखिन थालेका चर्चा-परिचर्चा, दातु संस्थाहरूमा प्रकोप व्यवस्थापन प्रति बढिरहेको चासो, आदिलाई शुभ संकेतका रूपमा लिनु अत्युक्ति नहोला ।

पत्रकारिता क्षेत्रको भूमिका

प्रकोप नियन्त्रण न्यूनीकरण पूर्वतयारी र व्यवस्थापन आदिमा पत्रकारिता क्षेत्रले निर्णायक भूमिका खेल्न सक्छ भन्ने यथार्थलाई हृदयगम गरेर नै IDNDR ले यस वर्षको आफ्नो मूल विषय Disaster and Media भनी निर्धारण गरेको छ ।

आजको युग ज्ञान नै शक्ति हो, (Knowledge is Power) हतियार नै शक्ति होइन भन्ने मान्यतामा विश्वास राख्छ र आजको युग जानकारी नै ज्ञान हो, ज्ञान नै शक्ति

हो, (Information is Knowledge, Knowledge is Power) भन्ने आजको विश्वव्यापी मान्यता प्रकोपको चुनौतीसँग सामना गर्ने शक्ति प्राप्त गर्नका लागि पनि मूल मार्ग दर्शन हो । पत्रकारिताको मूल धर्म नै जन मानसमा जानकारी प्रवाहित गर्नु भएकोले पत्रकारिताको भूमिका बिना प्रकोपको चुनौतीसँग सामना गर्ने शक्ति प्राप्त हुन नसक्ने कुरा निर्विवाद छ । त्यसैले भनिएको छ - "Prevention begins with Information !"

प्रकोपको सन्दर्भमा पत्रकारिता क्षेत्रको भूमिका दुई चरणमा हुन सक्छ -

- प्रकोप पूर्व (Pre- Disaster)

- प्रकोप पश्चात (Post - Disaster)

प्रकोप पूर्व (Pre- Disaster)

- प्रकोप न्यूनीकरणका संभावना र पूर्व तयारी सम्बन्धी विभिन्न सरकारी तथा अन्य निकायमा उपलब्ध सक्षमताबारे ज्ञान आर्जन गरी ती प्रति जनचेतना जगाउनु
- नीति निर्माताहरूलाई सजग बनाउनु
- जनमानसलाई आतंकित नबनाइकन सम्भावित प्रकोपबारे सूचना प्रवाह गर्नु
- सार्वजनिक निर्माण कार्यमा निगरानी राख्नु
- खानेपानी, विद्युत, अस्पताल, यातायात जस्ता अत्यावश्यक सेवा (Life Lines) लाई प्रकोप पूर्वतयारी प्रति घर्चघच्चाउनु
- विदेशमा भएका प्रकोप न्यूनीकरण एवं व्यवस्थापन प्रयास र नयाँ ज्ञान एवं प्रविधिसँग परिचित गराउनु
- प्रकोप विवरण (Disaster Profile) को व्यवस्था गर्नु
- आवश्यकता पहिचान र प्राथमिकता निर्धारणमा भूमिका खेल्नु

प्रकोप पश्चात (Post - Disaster)

- प्रकोप घटनाको तत्काल सूचना प्रवाह गर्नु
- क्षतिको तथ्यगत विवरण संकलन गर्नु
- जनमानसलाई आतंकित हुनबाट बचाउनु
- उद्धार र राहत कार्यमा निगरानी राख्नु, सो को राष्ट्रिय कार्यक्रमबारे सूचना संकलन एवं प्रसार गर्नु
- विपत्तिको बेला जनमानसलाई आपसी सहयोगका लागि अभिप्रेरित गर्नु एवं सान्त्वना दिनु
- प्रशासनीय कार्यको सरहाना गर्नु र उत्प्रेरणा दिनु
- नकारात्मक कार्यको आलोचना गर्नु
- विवादहरूको समाधानमा भूमिका निर्वाह गर्नु
- जनमत निर्माणमा सघाउ पुऱ्याउनु

- पुनर्स्थापना र पुनर्निर्माणमा सकारात्मक प्रभाव पार्नु

प्रकोपको लगत्तै पत्रकारिता क्षेत्र निकै सक्रिय देखिनु स्वभाविकै हो । तर प्रकोप पूर्वको चरणमा र प्रकोपको केही समय पछि भने त्यस्तो सक्रियता पाइने गरेको छैन । प्रकोप न्यूनीकरणका लागि प्रकोप पूर्वको चरणमा र प्रकोपको धेरै पछिसम्म पनि पत्रकारिता जगतले सक्रिय भूमिका निर्वाह गर्नु अत्यावश्यक छ । यसका लागि पत्रकारिता जगतलाई त्यस अनुरूपले अभिमुखीकरण (Orientation) गर्नु प्रकोप व्यवस्थापकहरूको महत्वपूर्ण दायित्व हो भन्ने पत्रकारहरूले पनि प्रकोपको घटनाको ताजा स्थितिमा मात्र त्यस तर्फ ध्यान दिने तर अरु बेला बेवास्ता गर्ने स्थितिलाई अन्त्य गर्नु जरुरी छ ।

साथै नेपाल लगायत दक्षिण एसियाका प्राय सबै जसो मुलुकका पत्रकारितामा राजनीतिक गतिविधि हलुका मनोरंजन, अपराध समाचार जस्ता विषयहरूले मात्र प्राय अधिकांश स्थान ओगट्ने गरेको तर प्रकोप जस्ता जन उपयोगी विषयहरू ओभोलमा परेको स्थितिमा पत्रकारिता क्षेत्र सजग हुनु आवश्यक भएको पनि महशुस भइरहेको छ ।

प्रकोप व्यवस्थापन सरकारको दायित्व मात्र होइन, न त यसलाई दातृ संस्थाहरू तर्फ पन्छाएर यसबाट छुटकारा

पाउन सकिन्छ । प्रकोपले प्रत्येक व्यक्ति, परिवार, समुदाय, राष्ट्र र सिंगो मानव जगतलाई नै प्रभाव पार्ने भएकोले यसको चुनौतीसंग सामना गर्न पनि सबै पक्षको सामूहिक प्रयास अपरिहार्य हुन्छ । अतः यो गहन जिम्मेवारीबाट पत्रकारिता जगत मात्र पृथक रहन सक्दैन ।

प्रकोप व्यवस्थापनमा पत्रकारले खेल्न सक्ने विनै सकारात्मक भूमिकालाई दृष्टिगत गरेर नै भूकम्प प्रविधि राष्ट्रिय समाज- नेपाल (NSET-Nepal) ले आफ्नो स्थापना कालदेखि नै पत्रकारलाई सक्रिय रूपमा संलग्न गराएको हो । वास्तवमा NSET-Nepal को यो एउटा प्रयोग थियो । IDNDR ले यस पटक आफ्नो सम्पूर्ण ध्यान पत्रकारितामा केन्द्रित गरेको तथ्यबाट NSET-Nepal को त्यो प्रयोग सफल भएको पुष्टि गरेको छ ।

अन्त्यमा

पत्रकारिता उज्यालो दिने एउटा दियो हो । यसलाई राम्ररी सदुपयोग गरेमा यसले अन्धकारलाई पन्छाएर उज्यालो दिन्छ, तर यदि यसलाई गलत ढंगले प्रयोग गरेमा वा दुरुपयोग गरेमा यसले आगलागी पनि गराउन सक्छ । प्रकोप व्यवस्थापनको सन्दर्भमा पनि पत्रकारिताको भूमिका ठीक त्यही दियोको जस्तै रहने कुरामा दुई मत हुन सक्दैन ।

**Best Wishes and Hearty Felicitations
on the auspicious occasion
of
International Symposium on
"Engineering Geology, Hydrogeology and
Natural Disaster with Emphasis on Asia"
Kathmandu, Nepal, September 28-30, 1999**

Soil, Rock & Concrete Laboratory

NEPAL ELECTRICITY AUTHORITY

Swayambhu, Kathmandu

Tel.: 271351

We are specialised in:

ALL KINDS OF GEOTECHNICAL WORKS

Earthquake Scenario-An Effective Tool for Development Planning (A Case Study - Kathmandu Valley Earthquake Risk Management Project)

A.M. Dixit*, L. Dwelley**, M. Nakarmi*, S. Basnet*, S. B. Pradhanang* and B. Tucker**

*National Society for Earthquake Technology - Nepal (NSET-Nepal), Kha-2-731, Mahadevsthan, Baneshwor, Kathmandu, Nepal, Tel/Fax: 977-1-474-192, email: nset@mos.com.np

**GeoHazards International, P.O. Box 7316, Stanford, CA, 94309 USA, Tel: 1 (650) 614-9050, Fax: 1 (650) 614-9051, email: info@geohaz.org

ABSTRACT

KVERMP includes a wide variety of activities aimed at addressing Kathmandu Valley's needs. One of the components of this project is Scenario and Action Plan preparation.

A simplified earthquake scenario will be developed describing the likely consequences of a hypothetical repeat of the 1934 earthquake in modern day Kathmandu Valley. Although the next major earthquake to affect Kathmandu Valley will not be identical to the 1934 event, this approach is assumed to be valid for planning purposes because the soft soil geology in Kathmandu Valley should dominate the shaking pattern produced by all distant earthquakes, which traditionally produce the most damage to the valley. The effects of the earthquake on Kathmandu Valley's infrastructure has been estimated by interviewing operators of critical facilities, incorporating existing studies, and conducting a workshop in which the interrelations of Kathmandu Valley's lifelines were examined.

Since the earthquake in 1934, Kathmandu Valley's population has increased by 400%. Kathmandu Valley's risk from earthquakes has increased even faster than its population. After the quake in 1934, residents gathered in open spaces which, today, have nearly all been filled in by buildings. In 1934, most homes were a maximum of two stories. Today, homes are routinely built by untrained masons up to heights of five and six stories, making them much more vulnerable to earthquakes. Estimates have been made of the damage that would occur if the shaking of the 1934 earthquake were to occur again today. These estimates are based on experiences in other earthquakes around the world.

People: 40 thousand deaths; 95 thousand injuries; 600 thousand or more homeless.

Buildings: 60% of buildings in valley damaged heavily. Residences are the most vulnerable structures.

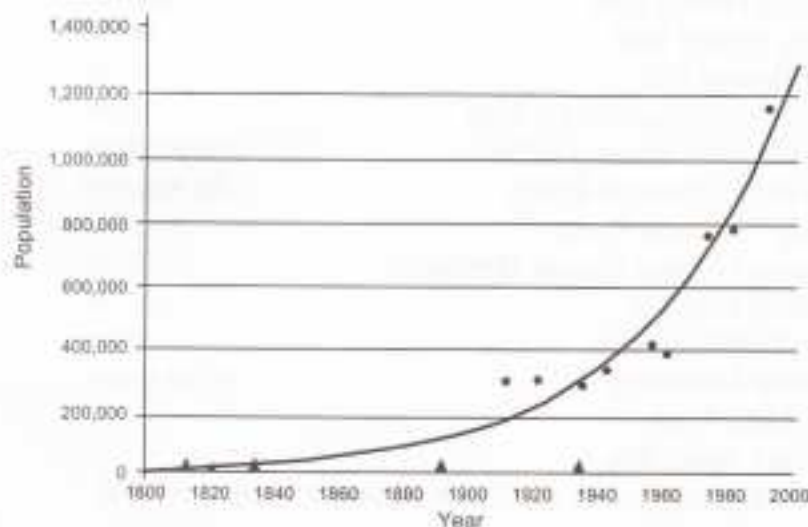


Chart showing Kathmandu Valley's population growth since 1800. The triangles indicate major earthquakes since then.

WE GO TO BOTTOM OF THE EARTH TO PUT YOU ON TOP OF THE WORLD

East Drilling Company (P) Ltd.

Basundhara, Ringroad, Kathmandu, Nepal

Tel.: 355737, P.O. Box: 1192, Fax: 977-1-417895

We provide services in Exploratory Drilling in collaboration with Geological and Geotechnical Investigation for:

- Foundation Treatment & Design
- Drain Hole Design
- Landslide Protection
- Pile Footing
- Tunnel Opening and Supporting

Our 14 drill rigs which have capacity ranging from 30 to 200 m can drill anywhere: plane alluvium to adverse terrain conditions, even underground.



Our Major Equipment

	Capacity	Quantity
• Percussion Drill	30 m	2
• Heavy Duty Rotary Drill	200 m	2
• Light Duty Rotary Drill	60 m	5
• Portable Rotary Drill	40 m	2
• Portable Mechanical Rotary Drill	30 m	3
• Heavy Duty High-Pressure Pump	200 Kg/cm ²	1
• Medium Duty Pressure Pump	150 Kg/cm ²	4
• Light Duty Pressure Pump	100 Kg/cm ²	3
• Underground Power Supply Generator	25 KVA	1
• NQ Wireline Drill Set	100 m	1
• Pile Hole Drill Assembly	12 m	2
• Packer Test Assembly	in all sizes	4 sets
• Soil Sampling Tools		5 sets
• In-situ Tests Assembly		5 sets
• Schemidt Hammer for In-situ Rock Strength Measurement		1
• Accessories for drilling		1000 m

Infrastructure: 10% of roads damaged; 55% of bridges damaged; 40% of water system damaged; 65% of electricity system damaged; 15% of urban areas expected to remain without water service for more than 6 months.

The next major earthquake to affect Kathmandu Valley will be an unprecedented disaster.

Earthquakes alone do not kill people, the collapse of man-made structures does! Although people cannot control the occurrence of earthquakes, people can definitely control the quality of man-made structures.

The lessons from the scenario will be used to create an action plan of mitigation activities. This action plan will include a small number of activities that are politically, financially, and

technically feasible. NSET-Nepal will review annually the progress that has been made towards the goals of the action plan, assess the reasons when progress has not met expectations, and write a report for the public.

There are many simple actions that can be taken now to reduce the deaths, sufferings, and impoverishment that will be caused by the next earthquake in Kathmandu Valley.

KVERMP aims to map out sound earthquake management policies for Kathmandu Valley and to begin the process of implementing them. The experiences gained in this project should be useful for other earthquake-threatened cities in developing countries, and should establish NSET-Nepal as a self-sustaining organisation that can carry on the work of this project after completion.

प्रकोप व्यवस्थापन तथा संचार Communication in Disaster Management

विश्वमणि पोखरेल
पत्रकार, कान्तिपुर पब्लिकेशन

सारांश

संयुक्त राष्ट्र संघले "प्राकृतिक प्रकोप न्यूनीकरण अन्तर्राष्ट्रिय दशक" का लागि यस वर्षको नारा "प्रकोप न्यूनीकरण र सञ्चार माध्यम" राखेको छ। राष्ट्रसंघले आफ्नो एक दशकको अन्तर्राष्ट्रिय प्रकोप न्यूनीकरण अभियानलाई प्रभावकारी बनाउनका लागि सञ्चारमाध्यमहरूलाई जनचेतना अभिवृद्धि गर्ने महत्वपूर्ण र प्रभावकारी सहयोगीको रूपमा लिन खोजेको छ।

राष्ट्र संघले जसरी सञ्चार माध्यमको भूमिका र महत्त्वलाई स्वीकार गरेको छ, त्यस अनुरूप सञ्चार माध्यम, सरकार र प्रकोप न्यूनीकरणसँग सम्बन्धित निकाय बीच व्यावसायिक सम्बन्ध, पारदर्शिता र सहकार्यको आवश्यकता हुन्छ। नेपालको सन्दर्भमा यस्तो खालको सम्बन्ध कायम गर्नको लागि बिद्यमान सरकारी सोचाईमा आमूल परिवर्तनको आवश्यकता छ। विश्व अहिले एकादशौं शताब्दीको संधारमा छ। अहिलेको समाजमा सञ्चार क्षेत्र सबै भन्दा छिटो विकसित हुदै गएको छ। आधुनिक विश्वलाई प्रविधिगत तुलना गर्ने हो भने विश्व सञ्चार समाज कम्प्युटर र सञ्चारको प्रविधिमा हिंडिरहेको छ। एउटा उन्नत समाजका हरेक क्रियाकलाप र समस्याहरू सञ्चार माध्यमबाट एउटा समाजबाट अरु विभिन्न समाजमा प्रवाहित हुन सक्छन्। आधुनिक सञ्चार उपकरण मानिसको

अतिव्याप उपयोगको वस्तु बन्दै गएको छ। समुन्नत समाज भनेकै सञ्चारका अधिकतम माध्यमहरूको उपयोग गर्नु नयाँ नयाँ घटना आ उपलब्धिहरूलाई ग्रहण गर्नु हो।

सञ्चार माध्यमले प्रयोग गर्ने सूचना, समाचारले नै समाजको आर्थिक, सामाजिक र राजनैतिक परिवर्तन समेत गर्न सक्छन्। जनताको जीवन शैलीमा परिवर्तन गर्न सक्छन्। सञ्चारका माध्यमले समाजमा ल्याउनसक्ने परिवर्तनलाई ध्यानमा राखेर नै राष्ट्र संघले सञ्चारका साधनहरूलाई सहयोगीको रूपमा लिइएको हो।

सञ्चार माध्यमले प्राकृतिक प्रकोप न्यूनीकरणमा कसरी भूमिका खेल्न सक्छ भन्ने विषयमा राष्ट्रिय अध्ययन हुनु जरुरी छ। सञ्चार माध्यमबाट प्रकोप न्यूनीकरण सम्बन्धी सामाग्रीहरू प्रसारण, प्रकाशन कसरी गराउने मुख्य समस्या यही हो।

नेपालको सन्दर्भमा सञ्चारका साधनहरूलाई सरकारी र गैर सरकारी दुई फरक क्षेत्रमा राख्नु पर्ने हुन्छ। यी दुई फरक क्षेत्रहरूको उद्देश्य, तथा प्रकाशन, प्रसारणका सामाग्रीहरूलाई दिने प्रारम्भिकता पनि फरक छ। सरकार नियन्त्रित साधनहरू सरकारको गुणगान र प्रशंसा गर्न रुचाउँछन् भने निजी क्षेत्रको चाहना त्यसको विपरीत छ।

निजी क्षेत्रले सरकारको आलोचना गर्नलाई बढी महत्व दिन्छ ।

सरकारी सञ्चार माध्यमले प्राकृतिक प्रकोप सम्बन्धी जानकारीहरूलाई सरल किसिमले जनता सामु पुर्याउने जागर देखाएको पाइँदैन ।

उता निजी क्षेत्रका, विशेष गरेर अखबारहरूले "प्राकृतिक प्रकोप न्यूनीकरण" गर्ने किसिमका नारा, जनचेतना जगाउने काम नि:शुल्क गर्न सक्दैनन् । समाचार

वाहेकका सबै खाले सामग्रीलाई विज्ञापन भनेर छाप्न चाहने निजी क्षेत्रका समाचार पत्र र सरकार बीच आपसी बार्ताबाट सूचनाजन्य समाचारको रूपमा कम शुल्कमा छपाउन सकिने वातावरण बन्न जरुरी छ । प्राकृतिक प्रकोपका तीनवटा पक्ष छन् । पहिलो प्राकृतिक घटना र त्यसबाट समाजमा पर्ने सक्ने असरका बारेमा अध्ययन, अन्वेषण दोस्रो प्राकृतिक प्रकोप र त्यसबाट उत्पन्न परिणाम र उद्धार कार्य तेस्रो प्रकोप पछिको पुनर्निर्माण । यी तीनवटा अवस्थामा सञ्चार माध्यमले महत्वपूर्ण योगदान दिन सक्दछ ।

Building Weaknesses and Improvement Measures

Bothara, J. K.

Structural Engineer, NSET-Nepal

ABSTRACT

Numerous seismic sources traversing Nepal and its surrounding, and the aerial seismic sources recorded by the instruments indicate that the country is significantly vulnerable to earthquake hazard. The region is frequently visited by minor to catastrophic earthquakes and more catastrophic earthquakes are expected in the future. In this century alone, the country was hit by four major to catastrophic earthquakes causing widespread human casualty, economic losses, and disruption to social fabric.

Worldwide studies of earthquake hazard and losses thus incurred show that more than 75 per cent of fatalities attributed to earthquake are caused by collapse of buildings. Again, the greatest proportions of victims die in collapse of masonry buildings, which is the most abundant building type in Nepal. The obvious and immediate cause behind the economic loss is the physical destruction of the built environment.

Buildings - residential, schools, administrative, historical and cultural - occupy the major part of the built environment and their vulnerability to earthquake damage is matter of greater concern.

In the past earthquakes, comparatively large-scale destruction to building environment has been observed. It is because of the inherent weakness of construction material and deteriorated quality construction process that has made the buildings highly vulnerable to earthquake shaking of even low intensities. The used construction material is basically governed by the local availability of the material and affordability of the owner. Due to the lack of knowledge, however the construction process largely does not include considerations for seismic strengthening, which can be easily incorporated either without any additional or at nominal additional cost. This paper identifies these inherent weaknesses in different building types and their possible remedies.

Street Drama : "Jannai Parne Kura Haru"

Organised by Lutheran World Federation/Nepal through United Welfare Union Drama Group, written by Anil Pande

Lutheran World Federation/Nepal, Disaster Preparedness Project started since 1996. Within this Project two types of programme are being implemented. They are Community Based Disaster Preparedness (CBDP) and School Earthquake Awareness Training (SEAT).

Objective: Community Based Disaster Preparedness aims at empowering the local people to manage their own preparedness, response and recovery activities and to build coalitions to help them respond to and recover from disaster.

Up to Sep.1998, 133 CDBP Training have been accomplished in 113 VDCs and 2 Municipalities. Out of this, 38 CDBP training were held in LWF area and 95 in partner organisations' areas. CDBP training materials are published as follows; CDBP Manual (in collaboration with NRCS, 1996), Fire Manual (in collaboration with NRCS, 1997), Landslide Manual (in 1998)

Objective: To lessen the impact of earthquake disaster in Kathmandu Valley through reduction of vulnerability of students, teachers and public.

Kathmandu Valley is the high vulnerable area of seismic region, building design could not follow the building code and population density is high so if earthquake occur in any time must of human and infrastructure damage and loss may be in Kathmandu Valley. In this reason, LWF/ Nepal select the area of SEAT programme has been implementing only in Kathmandu Valley private and public Schools (secondary/ Lower Secondary Level). Within this programme three awareness activities are implementing e.g. Earthquake Awareness Street Drama, Teacher's Training for School Earthquake Safety Plan and Earthquake Awareness Tips broadcast by Hits

FM Radio.

Up to Sep. 1998, 266 schools in Kathmandu Valley have received School Earthquake Awareness Training (Street Drama/Teacher's Training). District-wise schools are receiving as follows:

District	No. of schools to receive	No. of students
Kathmandu	150	19,800
Lalitpur	115	15,400
Bhaktapur	0	0

1,380 Earthquake Awareness Tips were broadcast through FM Radio.

DPP has been sending resource persons to provide CDBP Training as requested organised by Kathmandu Metropolis and Lalitpur Municipality.

DPP has been publishing training and awareness materials. The following booklets were published:

- Earthquake Safety Manual (in collaboration with the Nepal Geological Society in 1996)
- School Earthquake Safety Manual (in 1997)
- Earthquake Safety Leaflets (in 1998)

Sarsing (Rasuwa) Mb = 5.4 Earthquake of 31 January 1997

G.R. Chitrakar, B. Kumar and U. Gautam

*National Seismological Centre, Department of Mines and Geology
Lainchaur, Kathmandu*

ABSTRACT

The National Seismological Centre of the Department of Mines and Geology recorded an earthquake of Magnitude Mb = 5.4 on January 31, 1997 which was located at 28.06° N latitude and 85.34°E longitude. About 36 aftershocks were recorded within 5 days of main shock and all the events were processed by master events techniques. The distribution of aftershock defines

a well-constrained N 60°E-striking fault of about 3-km length. The fault plane solution of the main events shows a fault plane with strike N 60°E dipping 80° SE. The maximum focal intensity is estimated to be VI MM. The main event occurred on a transversal at structure segmenting the Himalayan arc at 85°E longitude. This structure correlates western rupture limit of the 1934 great earthquake (Pandey et. al, 1998).

SUB STRUCTURAL CONSULT (P.) LTD.

Consulting Engineers

EXPLORATORY DRILLING & LABORATORY SERVICES

Phone No.: 490431 Fax No.: 977-1-491364

P.O. Box No.: 3519, New Baneshwor

Kathmandu, Nepal

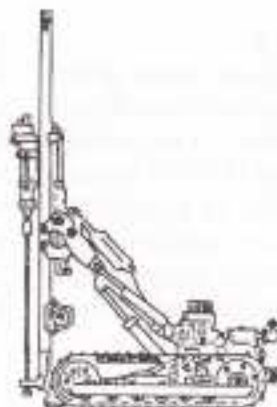
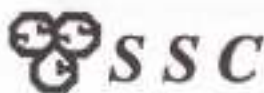
Email: ssc@wlink.com.np

We provide services in

- Roads
- Bridges
- Water Supply
- Small Hydropower
- Irrigation
- Environmental Study
- Public Health & Sanitation
- Socio-Economic Study
- Feasibility Study
- Exploratory Drilling
 - Pile Footing
 - Waterwell Drilling
 - Foundation Investigation
 - Landslide Investigation

We are equipped with

- Truck Mounted Drilling Machine
45 HP (American) Deep Tubewell
Boring of 300 m capacity.
- Acker Drilling Rig of 200 m
Capacity
- Kano 100 T. Percussion cum
Rotary Drilling Machine 3 nos. of
100 m capacity each
- Wire Line Drilling Facility
- Well Equipped Soil Lab.
- Well Equipped Concrete Lab.
- Pavement Investigation Equipment



Subsurface Electrical Imaging Techniques for the Investigation of the Natural Dam of Thulagi Glacier Lake

Surendra Raj Pant¹ and John M. Reynolds²

¹Central Department of Geology, Tribhuvan University, Kirtipur, Kathmandu, Nepal

²Reynolds Geo-Science Ltd., The Stables, Wren Farm, Nercwys, Mold, Flintshire, CH7 4ED, UK

ABSTRACT

The Thulagi Glacier Lake is in the north-western part of the Gorkha District, west Nepal. The lake has been identified as one of the most dynamic lakes of glacial origin. The lake is located on the upper reaches of the Dona Khola, one of the left tributaries of the Marshyangdi River. The Thulagi Glacial Lake is currently retreating very fast, about 50 m per year. The lake dam is holding about 30 million m³ of water (DHM & BGR, 1997). The area under investigation belongs geologically to the "Higher Himalayan Group" which consists mainly of gneiss and schist. The massif of Manaslu is composed of a huge granitic complex (DHM & BGR, 1997). According to the report produced by DHM and BGR (1997), the material which is considered to be sitting on the dead ice is made up of fluvial and lacustrine deposits. On the surface of the lake dam the material is composed of silty to sandy gravels, fine sands and silts.

In recent years, the scope of the application of geo-electrical methods has increased towards environmental and engineering aspects. New data acquisition and processing techniques facilitated to delineate sub-surface target of interest. One such application is for the study of glaciers, glacier lakes and natural dams. Application of electrical imaging in the Thulagi glacier lake dam enabled the delineation of buried glacier ice and permafrost zone. Data were proc-

essed by using a 2-D inversion programme and finite - difference forward modelling. The electrical resistivity image profiles show different zones of very high and low electrical resistivity distribution. The electrical resistivity values of processed image are very close to the true electrical resistivity distribution in subsurface. Since the initial electrode spacing was 5 m it was not possible to observe effects from near surface dry layers. After processing the data and taking into consideration all discussions and comparison, the following ranges of electrical resistivity are given to different materials:

Saturated materials	600-3,000 Ohm.m
Lake water	110 Ohm.m (at 2° C)
Ice-bonded permafrost	5,000-30,000 Ohm.m (?)
Dead ice	more than 50,000 Ohm.m

The electrical resistivity of permafrost zone is strongly dependent on particle size of the material: the resistivity for coarse-grained frozen material is higher than that of the fine-grained one. Transformation zone between ice-bonded permafrost and dead ice is not sharp: higher the electrical resistivity values the more ice content in the subsurface.

Reference

- DHM and BGR (1997), Thulagi Glacier Lake study, 24 pp., unpublished report.

**Best Wishes and
Hearty Felicitations
on
the Auspicious Occasion
of
Organising International Symposium on
“Engineering Geology, Hydrogeology and
Natural Disasters with Emphasis on Asia
Kathmandu, Nepal
September 28-30, 1999
by
THE NEPAL GEOLOGICAL SOCIETY**

EVEREST MARBLE & ALLIED INDUSTRIES (P) LTD.

**Putali Sadak, Kathmandu, Nepal
Tel.: 222580**

**Remember for Marble Slabs, Crazy Marble,
Marble Chips and Gravel**

ARTICLES OF COMMON INTEREST

Gold Placers Along the Rapti River Around Tarule Area, Dang District, Mid-Western Nepal

V. Dangol and P.D. Ulak

Department of Geology, Tri-Chandra Campus, Tribhuvan University, Kathmandu, Nepal

ABSTRACT

Placer gold of commonly less than 0.5 mm to sub-microscopic size occurs in the recent high-flood gravel and river bed materials along the course of the Rapti River (Fig. 1), Deukhuri valley, mid-western Nepal. Gold grains of 0.05 to 0.2 mm dimensions are generally found in the concentrates obtained by panning the river bed materials. Local people separate gold from other heavy fractions by using charcoal to melt the noble metal.

INTRODUCTION

The study area lies along the north-west of Taptkund along the Rapti River and nearly the central part of the Deukhuri valley, mid-western Nepal. It falls within the longitude 82°17'28"E and latitude 28°06'03"N. Geologically, Tarule is situated within the Siwalik Group of the Nepal Himalaya.

Recent to Quaternary deposits are widely distributed along the Rapti River valley and are composed of gravels, sands and clays, the thickness of which is generally more than 5 m. Most of the sand particles are derived from the Lower Member (MS1) of the Middle Siwaliks (MS), whereas the gravels are derived from the Upper Member (MS2) of the Middle Siwaliks (MS) and from the Upper Siwaliks. It seems that the Rapti River is supplying only the sand materials. The gold particles are found in the sand of the riverbeds at the bending of the Rapti River. Among them a few are still very productive, and some are abandoned from mining.

MINING

Local people actively pan the recent river sediments and recover gold successfully. They

generally do that work from November to April. Gold winning practice in the area was started by a tribe known as 'Khuna', and the 'Kumals' followed their work. However, now people of almost all the castes of the area are engaged in gold panning. For the gold mining, the local people use their indigenous technology. The main tools used to collect the river bed materials and panning are made by the wood of 'Dabdabe', whereas the screens are made of small bamboo (*Nigalo*) stems (Plate 1). The river bed materials are first collected either from flood plains or from the current river beds (Plate 2). Then the material is screened and panned. After separating gold with few other heavy particles, the people heat the concentrate. For this purpose, generally they use charcoal. In most of the cases, the people get almost pure gold, but sometimes the gold is combined with some other metals. Annual production of gold from a placer deposit is likely to be 2 kg and a total of about 35 to 60 kg of gold is believed to have been extracted so far.

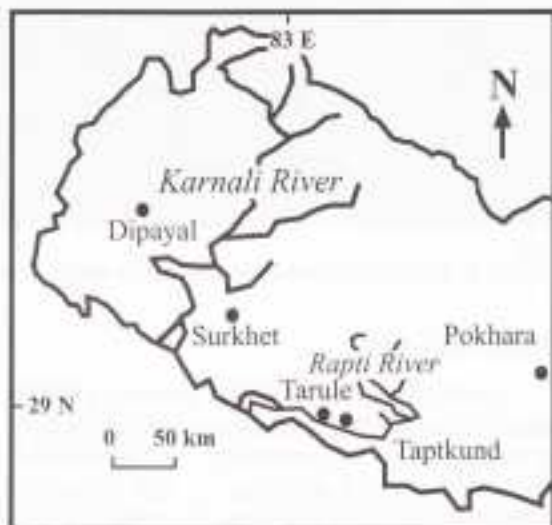


Figure 1: Location map of the gold placers at Tarule, the Rapti River, Deukhuri

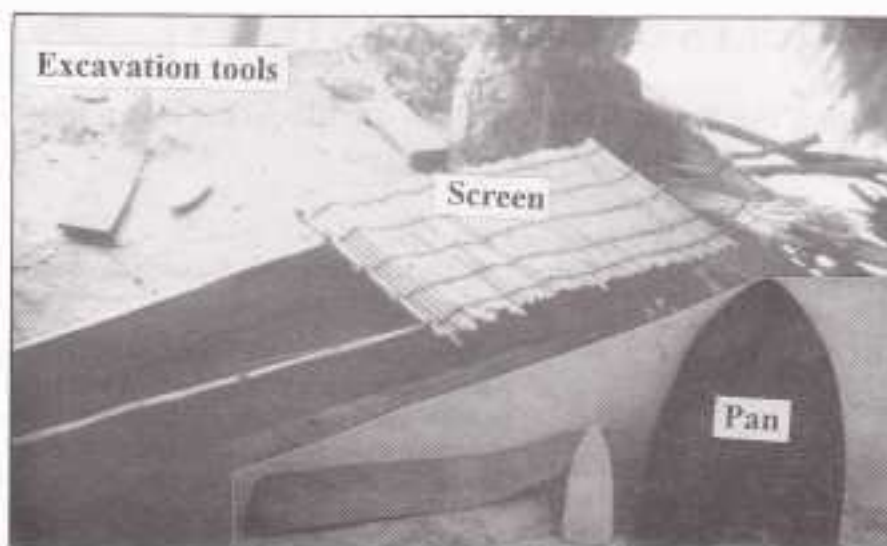


Plate 1: Excavation, screening, and panning tools used for the gold mining at Tarule, Deukhuri

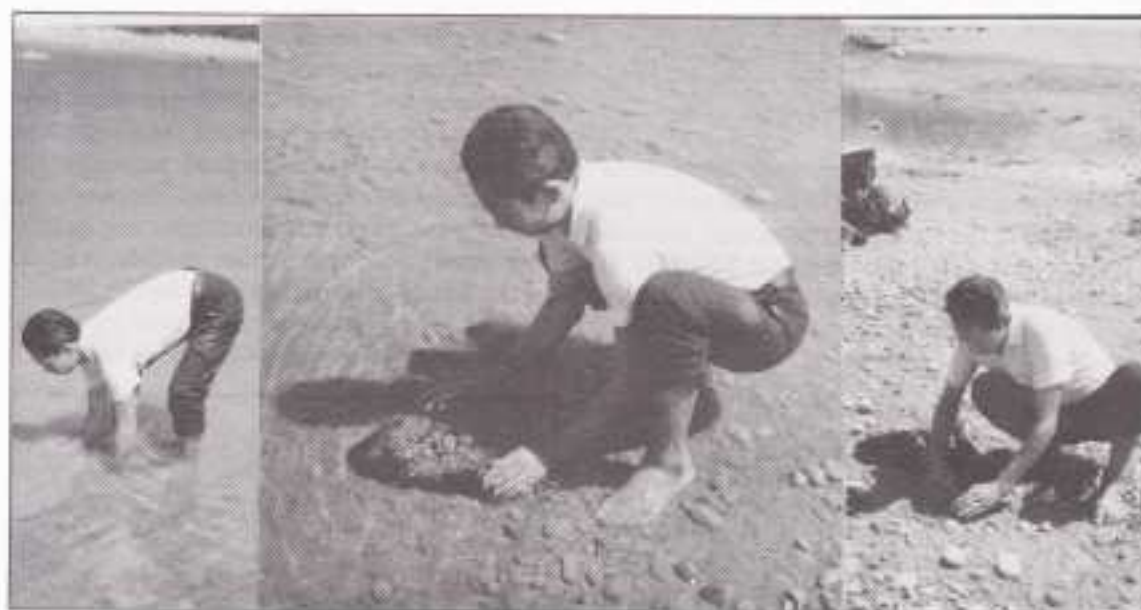


Plate 2: Process of gold concentrate extraction from the sand of the Rapti River at Tarule, Deukhuri

Nature of Gold

Gold recovered from the panning exhibits pale yellow to bright yellow and reddish yellow granular, flaky and sometime wedge-shaped. Besides free gold, electrum is also observed. Although no silver has been identified, a few samples resembling silver have been detected from the placers. Generally, the recovered gold

has the dimension ranging from 0.05 to 0.2 mm. Large grains reach more than 0.5 mm.

Tenor

No chemical study was accomplished to calculate the tenor of the deposit. However, from the analysis of production data obtained from the

local people, the average content of the gold is estimated at 1.5 g/ton. As the local people could extract only visible gold, it is assumed that the tenor of the placer gold deposit located in the Rapti River valley is supposed to be more than 3 g/ton.

DISCUSSION AND CONCLUSIONS

Visible gold grains are only mined in the study area. Some placers are already abandoned from mining. People use to mine only between November and April. They begin panning of

riverbed materials after the big floods cease, and they stop their mining work after they do not find large visible gold grains. This points out to the possibility of continuous feeding of gold to these placers by some other primary or placer deposits. A detailed geological work in this direction is needed to verify or falsify our assumption.

ACKNOWLEDGMENT

The authors express their sincere thanks to JICA and Professor K. Kizaki, JICA expert for their support to study the area.

नेपालमा धातु अन्वेषणमा भू-रसायनिक अन्वेषण प्रविधिको प्रयोग र त्यसको सफलता

कृष्णप्रसाद काफ्ले

सि.डि.जि., खानी तथा भूगर्भ विभाग

हाम्रो देश नेपालमा उपलब्ध प्राकृतिक श्रोतहरूमध्ये खनिज श्रोत (सम्पदा) एक जत्यन्त महत्त्वपूर्ण श्रोत हो । परापूर्वकालदेखि नै मानव जातिले खनिज पदार्थहरूलाई निर्माण सामग्री, डेकोरेशन, गरगहना, औषधि आदि विभिन्न रूपमा प्रयोग गर्दै आएको छ । आफ्नै देशमा पाइने यस्ता खनिज पदार्थ/श्रोतहरूको क्रमिक रूपमा विकास गरी खनिजजन्य उद्योगहरूको स्थापना गर्नसक्ने मुलुकको आर्थिक विकासमा यसले निरन्तर नै महत्त्वपूर्ण योगदान पुऱ्याउन सक्दछ । यस कुरालाई श्री ५ को सरकारले समयमै हृदयङ्कम गरी हाम्रो हिमाली देश नेपाल अधिराज्यको भौगोलिक विकटता (अवस्था) भौगर्भिक बनोट, यहाँ पाइने चट्टान र तिनमा हुनसक्ने खनिज पदार्थहरू जस्तै: धातु खनिज, चुनतुगा, डोलोमाइट, मार्बल, म्याग्नेसाइट, फोस्फोराइट सिलिका, सेमि प्रेसियस पत्थर, अधकिमती कोइला एवं प्रेसियसस्टोन (किमती पत्थर) जस्ता अधातु खनिज, पत्थरकोइला, प्राकृतिक गैस, पेट्रोलियम जस्ता उर्जाजन्य खनिज श्रोतहरूको बारेमा भौगर्भिक अध्ययन, अनुसन्धान एवं अन्वेषण गरि खनिजजन्य उद्योग प्रवर्द्धन गर्ने खानी तथा भूगर्भ विभागलाई सुम्पेको छ । खानी तथा भूगर्भ विभागले पनि नेपाल अधिराज्यमा रहेका खनिज सम्पदाहरूको प्रारम्भिक भौगर्भिक अध्ययन अनुसन्धान र खनिज अन्वेषण गर्ने काम विशेषत तल्लो हिमाली शृंखला (Lesser Himalaya) क्षेत्रमा पूरा गरिसकेको छ । यस प्रकारको अध्ययन तथा अन्वेषण गर्ने क्रममा विशेषत: धातु खनिज अन्वेषणमा भू-रसायनिक अन्वेषण प्रविधिको प्रयोग

तुलनात्मक रूपमा खर्चिलो एवं फलदायी हुने हुँदा यस प्रकारको अन्वेषण कार्यक्रम गत पाँचौं र छैटौं पन्च वर्षिय योजना कालमा (सन् १९७५ देखि १९८५ सम्म) समावेश गरिरहेको थियो । सोही अनुरूप सो अवधिमा यू.एन.डि.पी.को प्राविधिक सहयोग (Technical Assistance) मा खानी तथा भूगर्भ विभाग अन्तर्गत खनिज अन्वेषण विकास योजना (समिति) मार्फत पूर्वान्वलको मेचीदेखि मध्यपश्चिमान्वलको रुकुम-जाजरकोटसम्मको तल्लो हिमाली भूभागमा पर्ने करिब २८,००० ब.कि.मि. क्षेत्रमा प्रारम्भिक भू-रसायनिक अन्वेषण कार्य (Reconnaissance Geochemical Exploration) पूरा गरिएको थियो । सोहि अवधिमा खानी तथा भूगर्भ विभागलेपनि सुदूर पश्चिमान्वलको केही भाग र अन्य ठाउँहरूमा गरी करिब ८००० ब.कि.मि. क्षेत्रमा र आठौं पन्च वर्षिय योजनाकालमा यप ६००० ब.कि.मि. क्षेत्रमा र नवौं पन्चवर्षिय योजनाको पहिलो दुइवर्षमा करिब १२०० ब.कि.मि. क्षेत्रमा भू-रसायनिक अन्वेषणको काम संचालन गरि जम्मा करिब ४३,००० ब.कि.मि. क्षेत्रको भू-रसायनिक नक्सा तयार गरी त्यसमा विभिन्न केटागोरीका करिब २५० गोटा एनोमेलस एरिया पहिचान (एनमलि ट्रेस आउट) गर्नेकाम (पत्तालगाने काम) पूरा भएको छ । सो मध्ये विस्तृत खनिज अन्वेषणबाट जम्मा १० गोटा मिनरल प्रोस्पेक्टहरू मात्र पहिचान हुन आएकोमा ५ गोटा तामा, एक शिसा, जस्ता र एक तामा टङ्कटन गरि जम्मा ७ गोटा Subeconomic grade को खनिज भण्डार पत्ता लगाउन सफल भएको छ । उक्त ७ खनिज भण्डारहरूलाई

औद्योगीकरण गर्ने उद्देश्यले आवश्यक थप विस्तृत अध्ययन गर्दा उक्त खनिज भण्डारहरू आर्थिक दृष्टिले खानी खोल्न उपयुक्त नदेखिएकोले हालसम्म उक्त खनिज सम्पदाहरूको औद्योगीकरण हुन सकेका छैन ।

गतवर्षहरूमा संचालन गरिएका भू-रसायनिक अन्वेषणबाट नेपालको उत्तरी हिमालीभेगबाट दक्षिणतर्फ बग्ने धेरैजसो ठूला नदीहरूको बगरमा (वालुवामा) सुनका कणहरू देखा परेका छन् । हिउँदयाममा स्थानीय वासिन्दाहरूले महाकाली नदी, चमेलिया नदी, कर्णाली नदी, भेरी नदी, राप्ती, लुङ्गीखोला, कृष्ण गण्डकी, मर्स्याङ्दी, बुढी गण्डकी, शिशुनी र सुनकोशी नदीहरूका वालुवामा सुन चाँसो आफ्नो जीविकोपार्जन गर्दै आएको पाइन्छ । उक्त एलुमिएन (प्लेसर) गोल्ड (सुन) को ग्राइमरी सोर्स पतालागाउन खा.त.भू.वि. का विशेषज्ञहरू कार्यरत छन् । उहाँहरू थप विस्तृत अन्वेषण गरेमा नेपालमा सुनको खानी (भण्डार) पत्ता लगाउन सफल हुने कुरामा दुई विश्वास गर्नुहुन्छ ।

भू-रसायनिक अन्वेषण गर्ने बाँकी रहेका सुदूर-पश्चिमान्धल र मध्य-पश्चिमान्धल विकासक्षेत्रमा पनि अन्य करिब १२,००० वर्गकि.मि. क्षेत्रमा पनि उक्त कार्य संचालन गरी सम्भाव्य धातु खनिज पदार्थहरूको एनोमलि/प्रोस्पेक्ट पहिचान गर्ने उद्देश्यले चालु नवौं पंच वर्षीय योजना कालमा उक्त क्षेत्रका बाजुरा, आँखाम, कालिकोट, जुम्ला, दैलेख, रुकुम, रोल्पा, जाजरकोट, सल्यान र प्युठान जिल्लाहरूमा करिब ६,००० वर्गकि.मि. क्षेत्रमा उक्त अन्वेषणको कार्य गर्ने योजना अनुसार गत आ.व.सम्ममा

करिब १,२०० वर्गकि.मि. क्षेत्रमा उक्त काम पूरा भइ केही स्थानमा तामा, शिसा, जस्ता, सुन र युरेनियमका एनोमलिहरू पहिचान गरि उक्त क्षेत्रमा देखा परेका एनोमलि मध्ये Category अनुसार सबैभन्दा राम्रो देखिन आएका स्थानमा Follow-Up अन्वेषण कार्य गर्ने Target area पहिचान गरिएको छ, भने तिनीहरूमध्ये केहीको सम्भावित श्रोत Source area पनि पहिचान गरिएको हुँदा थप विस्तृत अन्वेषणको काम संचालन गर्ने कार्यक्रम रहेको छ ।

यस प्रकार नेपाल अधिराज्यको तल्लो हिमाली शृङ्खलामा धातु खनिज अन्वेषणमा भू-रसायनिक अन्वेषण प्रविधि विभिन्न घाउहरूको श्रोत पत्तालाउन निकै सहयोगी एवं सक्षम भएको छ । तर नेपाल अधिराज्यमा हालसम्म प्राप्त भएका धातु खनिज श्रोतहरूको भण्डार भने धेरै जसो साना साइजका र तिनमा रहेका मेटल (धातु) खनिजको मात्रा पनि कम भएका कारण ती खनिज भण्डारहरूमा आधारित खानी संचालन गर्न तथा खनिज उद्योग स्थापना गर्न आर्थिक दृष्टिले लाभप्रद नहुने देखिन आएकोले हालसम्म उक्त खनिज भण्डारहरूको औद्योगीकरण हुन सकेको छैन । तर पनि थप भौगर्भिक अन्वेषण एवं अनुसन्धानबाट अन्य कुनै ठूलो खनिज भण्डार भेटिन गएमा तथा विश्व बजारमा उक्त मेटलहरूको भाउ बढाएको अवस्थामा यी हावा खनिज भण्डारहरू सञ्चालन हुनसक्ने र खनिज अन्य उद्योगहरू स्थापना हुन सक्ने तथ्यालाई विचार गरि नयाँ प्रविधि अपनाइ देशका विभिन्न भागमा खनिज अन्वेषणको काम अगाडि बढाउनु जरुरी छ ।



MULTI DISCIPLINARY CONSULTANTS (P) LTD.

P.O. Box: 5720, Kathmandu, Nepal
Tel: 525076, 529304, Fax: 977-1-523103
E-mail: mdc@mos.com.np
URL: <http://mdc.freeservers.com>
Intra: <http://www.indreni.net.np>

Our Services

Multi's professional activities cover a wide range of fields as follows:

- ✦ Building, Physical Planning and Urban Development
- ✦ Construction Administration and Management
- ✦ Energy, Hydropower and Electrification
- ✦ Forestry and Environment
- ✦ Hydropower Informal Education & Training
- ✦ Irrigation, Agriculture and Rural Development
- ✦ Management and Institutional Development
- ✦ Public Health and Medicine
- ✦ River Training and Flood Protection
- ✦ Survey and Data Base
- ✦ Transportation and Traffic Management
- ✦ Water Supply, Sanitation and Urban Drainage
- ✦ Structural and Aseismic Design
- ✦ Geotechnical Investigation and Material Testing

Engineering and Environmental Geological Mapping in Kathmandu and Pokhara Valleys

B. M. Jnawali and G. B. Tuladhar

Department of Mines and Geology

Lainchaur, Kathmandu

1. Introduction

Basic geo-scientific data essential for any urban planning and infrastructure development is virtually lacking in Nepal. Importance of integration of these data in landuse planning and infrastructure building has been overwhelmingly felt with rapidly increasing pressure of population, which in turn is creating considerable stress in the environment and depletion of natural resources, particularly construction materials and groundwater. Many institutions are involved in addressing these problems to improve the prevailing situation of Kathmandu Valley but little or no interaction takes place often leading to duplication of works.

To solve the complex problems of fast growing urban areas, decision makers and planners need accurate and up-to-date information about landuse, geological condition and natural resources. With realisation of need of such basic geo-scientific information for proper planning and further development, the Environmental Geology Project (EGP/1994-98) of the Department of Mines and Geology (DMG) has carried out engineering and environmental geological mapping of Kathmandu and Pokhara valleys using GIS/RS with technical assistance of the Federal Institutes for Geosciences and Natural Resources (BGR), Germany.

2. Objectives

The main objectives were:

- to produce engineering and environmental geological maps of Kathmandu and Pokhara valleys using GIS with a view to demonstrate the utility of geo-scientific information in urban/ infrastructure planning and development and environmental protection.
- to strengthen the capacity of DMG for providing environmental geological services in developmental activities using modern technology.

3. Achievements

The following final maps with reports have been produced by the project:

1. Engineering and Environmental Geological Map of Kathmandu Valley (Scale 1:50 000)
2. Engineering and Environmental Geological Map of Pokhara Valley (Scale 1:50 000)
3. Barrier Potential Map for Waste Disposal Selection in Kathmandu Valley (1:50 000)
4. Barrier Potential Map of Soils of Kathmandu Valley (1:50 000)
5. Hydrogeological Condition and Potential Barrier Sediment in Kathmandu Valley (1:50 000)
6. Environmental Geological Map of Kathmandu Valley (1:50 000)
7. Environmental Geological Map of Pokhara Valley (1:50 000)
8. Landslide Hazard Zonation Map of Phewa Lake Catchment Area (1:50 000)

The Engineering and Environmental Geological Maps of Kathmandu and Pokhara are published for wider dissemination and will be for sale very soon in the market. Other maps in the form of computer prints could be made available to the potential users upon official request. However, a policy is being formulated with regard to dissemination or sharing all kinds of departmental data including digital.

4. Information Delivered by the Maps

Main highlights on the geo-information delivered by the respective maps can be presented as follows:

4.1 Engineering and Environmental Geological Maps:

Geological Hazards and related Environmental Problems

- Subsurface geologic condition for foundation stability
- Low bearing capacity areas
- Flood-prone areas
- Sinkholes and land subsidence hazards
- Landslide, block-fall, river-bank cutting and gully erosion hazards
- Mining hazard
- Liquefaction hazard

Natural resources

- Groundwater resource (well field and recharge area)
- Mineral resource (mainly construction materials)
- Gas field area

Landuse

- Agricultural land
- Forest land
- Settlement area
- Industrial area
- Open space/recreation ground

Geo-environment and Pollution

- Water pollution due to municipal waste and industrial effluents
- Soil contamination
- Air pollution

Other Information

- Waste disposal sites
- Natural heritage
- Geological sites of national importance
- Infrastructure etc.

4.2. Potential Areas for Waste Disposal in Kathmandu Valley

Main Features

- Areas of barrier potential
 - High: CEC (Cation Exchange Capacity) > 16 mmol/100g

Moderate: CEC 12 - 16 mmol/100g

Low: CEC < 12 mmol/100g

- Existing and proposed land-fill sites (includes areas explored by drill holes to a maximum depth of 8 m).

- Areas sensitive to waste disposal:

Settlement areas both existing and proposed

Well-field or groundwater abstraction area

Pond, reservoir, spring etc.

Cultural heritage and scenic places

Airport etc.

The scientific concept behind geological barrier of any land-fill site is that the underlying soils or rocks should be sufficiently impermeable with adequate thickness and extension to act as protective barrier to prevent infiltration of pollutants into groundwater. In addition, the nature of soils should be attenuative of dissolved chemical constituents. Therefore, geological barrier or natural barrier is an important part of overall safety concept for waste disposal site.

4.3. Hydrogeological study of Kathmandu Valley

The hydrogeological study conducted in the Kathmandu Valley under EGP furnishes the following information :

- Various well logs
- Assessment of natural geological barrier within sediment body
- Groundwater levels of shallow and deep aquifers
- Influence of over-exploitation on the groundwater head
- Hydrochemical status of groundwater: GW quality (deep and shallow aquifers) (EC, BOD, COD, DO, Cl, Fl etc.)
- Surface water quality

5. Conclusion

The information obtained from the engineering and environmental studies in Kathmandu and Pokhara valleys constitutes a good scientific base for:

- Sustainable landuse and land development /new settlement planning
- Planning urban infrastructure development
- Planning hazard mitigation and environmental protection
- Selection of potential areas for waste disposal
- Identifying potential areas for extraction and mobilisation of natural resources like construction materials and groundwater
- In assessment of area in terms of geo-hazards including threat to pollution of groundwater and in taking precautionary measures to mitigate hazards and protect environment.

The maps can serve as a cost-effective and efficient source for sustainable regional urban planning, but cannot replace the detailed site investigation essential for specific design and construction.

Any future expansion of Kathmandu and Pokhara cities or physical development in these cities should be guided and controlled with proper planning and technological intervention taking the geo-environmental factors into full consideration.

Otherwise we will be liable to pay a very heavy price in the future.

Applicability of the maps and their limitations:

- Useful to extract geo-environmental information for sustainable landuse planning and land development
- Furnishes general information about present status of landuse and ground condition (bearing capacity) for civil construction.
- In identification of potential areas for extraction and mobilisation of natural resources like construction materials and groundwater
- In identifying areas sensitive to environment and need protection.
- In recognising possible areas for land-fill site selection.
- In assessment of area in terms of geo-hazards including threat to pollution of groundwater and in taking precautionary measures to mitigate hazards and protect environment.

The maps can serve as a cost-effective and efficient source for sustainable regional and urban planning, but cannot replace the detailed site investigation essential for specific design and construction.

BEST WISHES AND FELICITATIONS TO NEPAL GEOLOGICAL SOCIETY **WATER RESOURCES CONSULT (P.) LTD.**

Babarmahal, Kathmandu, Tel. No. 251518

E-mail: prakash@wrcpl.wlink.com.np

WATER RESOURCES DEVELOPMENT IS OUR FIELD OF
SPECIALIZATION

&

WE OFFER SERVICES ON MULTI DISCIPLINARY ENGINEERING
FIELDS INCLUDING

- HYDROPOWER DEVELOPMENT RELATED STUDIES (Feasibility & Detailed Engineering)
- PROJECT PREPARATION
- SURVEY, DESIGN & PROJECT MANAGEMENT
- ENVIRONMENTAL STUDIES & AUDITING
- IRRIGATION
- GEO-TECHNICAL STUDIES AND INVESTIGATION
- SOCIO-ECONOMIC STUDIES
- TOWN PLANNING & PROFILE
- LANDSLIDES & DEBRIS FLOWS STUDIES

काठमाडौं उपत्यकाको भूकम्प जोखिम

माधव राज पाण्डे

राष्ट्रिय भूकम्पमापन केन्द्र, खानी तथा भूगर्भ विभाग, लैनचौर, काठमाडौं

काठमाडौं उपत्यका पछिल्लो करीव १० लाख वर्ष यताको भौगर्भिक क्रियाशीलताको उपज मानिन्छ। चारैतिरबाट पहाडद्वारा परिवेष्टित यो सुन्दर उपत्यका परापूर्वकालदेखि मानव समाजद्वारा बसोबास गर्न थुनिएको उत्तम स्थान हुन जानुमा उपत्यकाको कृषिजन्य जमीन र जहाँतही पाइने पानी नै मुख्य कारण थिए। यस उपत्यकामा पहिलो बसोबास कहिलेदेखि भयो भनि गरी भन्न नसकिए पनि यस उपत्यकामा गोपाल, लिच्छवि आदि कैयौं वंशजहरु फलेफुले र पृथ्वीको गर्भ भित्र चिलाए। अहिले यी वंशजहरुको स्मृति स्वरूप रचनाहरु फाटफुट कहींकहीं अवशेषका रुपमा मात्र फेला पार्न सकिन्छ।

यो उपत्यकाको भौगर्भिक विकास १० लाख वर्ष पहिले शुरू भएपनि शुरूको उपत्यका धेरै सानो थियो। समयानुक्रममा भौगर्भिक प्रक्रियाको फलस्वरूप यो उपत्यका विस्तार हुदै गयो। यो विस्तार प्रक्रियालाई मोटामोटी तीन चरणमा विभाजन गर्न सकिन्छ। जसमध्ये दुई मुख्य चरणहरुको अवधि ५-५ लाख वर्ष र पछिल्लो चरणको अवधि करीव ५० हजार वर्षको हुन सक्छ। उपत्यकाको सिर्जना शुरू भए देखिको पहिलो ५ लाख वर्ष सम्म खोला, नाला तथा नदीको प्रभावमा यस उपत्यका विस्तार हुन गएकोले यस चरणमा करीव २०० मीटर मोटो बलौटे परत उपत्यकाको चट्टानी पीधमाथि थपिन गयो। यस्तो बलौटे परतका आफ्नै भू-भौतिक तथा इन्जिनियरिङ गुणहरु छन्। स्मरणीय छ कि खोला, नदीहरुको विकास भौगर्भिक विकासको प्रभावमा हुन्छ। त्यस्तैगरी उपत्यकाको विकासको उपरोक्त कालको खण्ड दक्षिण चुरिया पहाडको फेद वा महाभारत पहाडमा हुने अर्को सम्बन्धीन प्रक्रियासँग सहसम्बन्धित गर्न सकिन्छ। वास्तवमा भन्ने हो भने यी सबै प्रक्रियाहरु ठूलो प्रक्रियाको विभिन्न स्थानमा हुने स्थानीय प्रक्रियाहरु मात्र हुन्।

दोस्रो ५ लाख वर्षको अवधिको चरणमा उपत्यकाको मध्य भागमा तालको विकास तथा विस्तार हुन गयो। यस चरणमा करीव २ देखि ३ सय मीटर मोटाई भएको खास प्रकारको चिम्टि माटो पहिलो चरणमा बनेको बलौटे परत माथि थपिन गयो। यो चिम्टि माटोको भू-भौतिक तथा इन्जिनियरिङ गुण आफ्नै प्रकारका छन्। उपत्यकाको उत्तरी भागमा भने खोला-नाला र नदीबाट प्रभावित उपत्यकाको

विस्तार हुन गई बलौटे र चिम्टि माटोको मिश्रण थपिन गयो।

तेस्रो करीव ५० हजार वर्षको चरण ताल सुकेपछि हालको उपत्यकाको अवस्थासम्मको हो र ठाउँ हेरि २० मीटरसम्म मोटाई भएको चिम्टि माटो र बालुवाको मिश्रण थपिन गएको छ। यसको पनि आफ्नै खालको भौतिक गुण छ। यसप्रकार काठमाडौं उपत्यकामा करीव ५ सय मीटर मोटाई सम्म अझै चट्टानमा परिणत नभइसकेको परत विद्यमान छ।

उपत्यकाको चट्टानी पीध पनि समथल छैन। यो थुम्का-थुम्की, उच-नीच खोल्सा इत्यादिले भरिपूर्ण भई थेंगोबाट ढाकिई लुप्त अवस्थामा रहेको धरातल हो।

काठमाडौंको जस्तै भौगर्भिक प्रक्रियाको फलस्वरूप खोला-नदीबाट ल्याइएको थेंगोको तह र तालमा थपिएको तह भएका उपत्यकाहरुमा आसपासका पहाडी क्षेत्रमाभन्दा धेरै ठूलो भूकम्प प्रकोप तथा विनाश भएको देखिन्छ। सन् १९८५ को मेक्सिकोको ८.१ म्याग्निच्युडको भूकम्पबाट मेक्सिको शहरमा भएको विनाश पछि यसवारे लेखाजोखा गरिँदा कडा चट्टानमा भन्दा उपत्यकाको ताल थेंगो रहेको भागमा ८ देखि ५० गुणा सम्म बढी विस्तृत भएको कुरा प्रकाशमा आएको छ। यस्तो ठूलो प्रकोप हुनुमा मुख्य मुख्य कारणहरु ताल थेंगोमा अनुप्रस्थ अर्थात् तैसी तरङ्गको गति, उपत्यकाको पीधको गहराई र धरातल, थेंगोहरुको चरणबद्ध बनावट र मोटाई लगायत हुन्।

भूकम्पको तरङ्ग चट्टान मार्फत प्रसारण हुँदै अन्त्यमा चट्टान बन्न नसकेको थेंगो हुँदै सतहमा आइपुग्छ। यसो हुँदा थेंगोले तरङ्गलाई विस्तृति गर्दछ। ताल चिम्टि माटोको थेंगोमा तरङ्गको गति कडा चट्टानको तुलनामा एकदम कम भएकोले तरङ्ग धेरै नै विस्तृत हुन्छ। यसरी विस्तृत हुँदा खास खास तरङ्ग लम्बाई अर्थात् खास खास कम्पन अवधि हरूमा मात्र यस्तो ठूलो विस्तृति हुन जान्छ। खास कम्पन अवधि कुल थेंगोको मोटाई अर्थात् पीधको गहराई र खण्ड खण्ड थेंगोको मोटाईमा भर पर्दछ। अर्कोतिर भवन तथा विभिन्न संरचनाहरुको लम्बाई, चौडाई, उचाई र बनावट अनुसार आ-आफ्नो कम्पन अवधि हुन्छ। यदि प्रसारण भई आएको तरङ्गको अवधि र संरचनाको कम्पन अवधि मिलेमा अति ठूलो विनाश हुन जान्छ। केही

अध्ययनहरूको आधारमा हेर्दा काठमाडौं उपत्यकाको तालले डाकिएको ठाउँमा ०.२-०.५ सेकेन्ड कम्पन अबधिहरूमा प्रवेगको ठूलो विस्तृति हुने देखिन्छ। यसरी खास प्रकारको कम्पन अबधि भएका संरचनाहरूलाई मात्र उच्च प्रवेगले क्षति गर्ने हुँदा यसलाई ध्यानमा राख्नु अति आवश्यक छ। चाहे त्यो नयाँ निर्माण होस्, चाहे सुदृढीकरण होस्, संरचनाको कम्पन अबधि लेखाजोखा गरी जमिनले विस्तृति गर्ने अबधिलाई ध्यानमा राखेर मात्र अरु निर्माणहरू लिनु अत्यावश्यक छ। यस्तो क्षेत्रमा धेरै समस्याको प्रभावकारी समाधान १ वा २ तल्ले र बढिमा तीन तल्ले सम्मका संरचना हुनसक्छन्। जनसंख्या, आर्थिक उपज इत्यादि दृष्टिकोणबाट आजको एक्काइसौं शताब्दीको दोस्रोधमा यो हास्यास्पद देखिन गएता पनि प्रकृतिसँग सम्बन्धिता गर्नु नै अन्ततोगत्वा बुद्धिमानि हुन सक्छ।

सन् १९३६ मा डा. जे. वि. ओडेनबाट प्रकाशित काठमाडौंको वि. सं. १९९० को महा-भूकम्पबाट उत्पन्न भएको इन्टेन्सिटी नक्सा वा मे. ज. बम्हशम्योर ज. ब. रा. बाट प्रकाशित काठमाडौं उपत्यकाको वि. सं. १९९० को भूकम्पबाट भएको विनाशको नक्सालाई काठमाडौं उपत्यकाको धेरै सम्बन्धी नक्सा माथि राखी हेर्दा सब भन्दा ठूलो १० इन्टेन्सिटीको विनाश ताल क्षेत्रमाथि देखिन्छ। यो कुरा दुई दशक यताका प्रकाशित तथा अप्रकाशित प्रतिवेदनहरूमा औल्याइएको छ। चारैतिर पहाडमा ८ इन्टेन्सिटी भएको हुँदा ताल क्षेत्र भित्र २ अधिक इन्टेन्सिटी हुनुको कारण ताल धेरैको कारण भएको विस्तृति नै हो। मोटा मोटी लेखाजोखा गर्दा ८ इन्टेन्सिटी क्षेत्रमा भूकम्पको कारणले उत्पन्न हुने प्रवेगको स्तर ०.५ गुरुत्वाकर्षण प्रवेग मान्ने हो भने १० इन्टेन्सिटी क्षेत्रमा यो ०.८ सजिलै हुन सक्छ। जस अनुसार ८ गुणा विस्तृति काठमाडौंको अवस्थामा धेरैको असर हुन जान्छ।

धेरैबाट हुने विस्तृति को तुलनामा पीधको धरातल इत्यादि अन्य कारणको प्रभाव धेरै कम हुन्छ। यद्यपि विस्तृत विश्लेषणमा भने यसको लेखाजोखा गरिनु आवश्यक छ।

वास्तवमा धेरैबाट भरिएको उपत्यकाको भूकम्प प्रकोपको समस्या जटिल हुनुका साथै यसको अध्ययनको लागि मोडेलिङ प्रविधि तथा पर्याप्त सैद्धान्तिक ज्ञान र अनुभव आवश्यक पर्दछ। हाल देखापरेको समस्याको भौतिक

समझदारीको ह्रास, परिमाणात्मक मोडेलिङबाट पलायन हुने प्रवृत्ति, सैद्धान्तिक ज्ञानको कमीलाई दृष्टिगत गर्दा निरुत्साहित हुनुपर्ने अवस्था छ।

भूकम्प प्रकोप बारे कुरा गर्दा एउटा अर्को प्रक्रियाको पनि विवेचना हुनु आवश्यक छ। यो जमीन भित्र हुने बलौटे माटो तहको तरलीकरण हो जसले गर्दा भार बहन गर्न सक्ने क्षमताको पूर्णह्रास हुन्छ। भूकम्पको तरङ्ग प्रसारण हुँदा पानीबाट संतृप्त भएको बलौटे धेरैको तहमा भूमिगत पानीको दबाव बढ्दै जान्छ र यसरी एकिकृत भई बढ्दै गएको दबावको प्रभावमा परी कुनै बिन्दुमा पुगी आफ्नो भार बहन क्षमता गुमाउँछ।

यस्तो प्रक्रिया हुन सर्वप्रथम पानीबाट संतृप्त भएको बलौटे माटोको तह जमीनमुनि विद्यमान हुनुपर्छ। भूकम्पबाट उत्पन्न हुने प्रवेग र यस्तो प्रवेग अबधिको सामूहिक असरबाट यो प्रक्रिया सक्रिय हुने बिन्दुसम्म बलौटे माटोको तहमा पानीको दबाव बढ्नुपर्छ। वास्तवमा अबधिको सट्टा प्रवेग उच्च-नीच हुने आवृत्तिको संख्या र प्रवेगको परिमाणको सामूहिक प्रभावमा यो प्रक्रिया हुन जान्छ।

साधारणतया यस्तो प्रक्रिया ५० फीटको गहराईसम्म हेर्ने गरिन्छ। काठमाडौंको भौगर्भिक अवस्थामा ५० फीट गहिराईमा पानी समेतको बलौटे तह त्यति प्रचुर मात्रामा पाइदैन र बढीमा ५-६ फीटसम्म मोटाईको हुन्छ। यो कुरा काठमाडौंको काकाकुल जनताले पानीको लागि गरेको ट्यूबवेल चोरिडबाट शह्रा पाइन्छ। यति सानो मोटाईमा व्यवहारिक दृष्टिकोणबाट तरलीकरण हुन सक्दैन। तरङ्ग लम्बाईको २.५ प्रतिशत मोटाई अब्यात करीब २० फीटको पानी समेतको बलौटे तहमा तरलीकरण हुन प्रवेग उच्च-नीचको आवृत्ति संख्या सैद्धान्तिक संख्या भन्दा १० गुणा बढी चाहिन्छ। तसर्थ ५-६ फीटको मोटाईमा तरलीकरण हुने संभावना छैन। २० फीट भन्दा बढी मोटाई भएको बलौटे तह पाइने साँधुरो सोतोमा मात्र यसको अध्ययन सिमित गरे हुन्छ।

काठमाडौंमा खनिएका इतार तथा भूमिगत निर्माणको लागि पारिएका ठूला खाडलहरूमा विभिन्न सरोकार राख्ने समुदायहरूले यस्तो प्रक्रिया खोजिरहेछन्। यदि फेला परेमा सबैले सिकने तथा बुझ्ने मौका पाइन्थ्यो।

पहिलो पल्ट ०५६-१-२१ मा कान्तिपुरमा प्रकाशित

PARTICIPATION/REPRESENTATION OF THE NGS IN VARIOUS MEETINGS AND ACTIVITIES

Mr. R.K. Aryal, President, Nepal Geological Society has taken active participation in the following events:

- Seminar on closing of Environment Geology Project/DMG on Friday, 4 Dec. 1998, Hotel Shangrila, Kathmandu.
- Earthquake Risk Management Action Plan Workshop, Oct. 28-29, 1998, organised by National Society for Earthquake Technology - Nepal (NSET-Nepal), Kathmandu.
- Sixth National Convention of Engineers on Resources Management of Infrastructure Development, Dec. 3-4, 1998, Nepal Engineers' Association (NEA), Kathmandu.
- Environmental Change and Its Influence on Mammalian Evolution in Asia during late 20 million years, Jan. 8, 1999, National History Museum, Swayambhu, Kathmandu.
- Earthquake Safety Day Deceleration and Earthquake Safety Awakening Exhibition, Jan. 16-18 (NSET-Nepal), Kathmandu.
- International Seminar on Water Induced Disaster (ISWID), Kathmandu, 1998.
- Strategic Planning Workshop, June 11-13, 1999 (NSET-Nepal), Kathmandu.

Mr. K.P. Kaphle, Former President and Life Member of NGS, took part in the discussion on "Role of Scientific Professional Societies for Upgrading the Capabilities of Science and Technology", organised by the Ministry of Science and Technology on 24 December 1998 (9 Poush 2055). Mr. Mohan B. Karki, Special Secretary, Ministry of Science and Technology, Dr. Kedar Lal Shrestha, Adviser to the Ministry, and representatives from various professional societies e.g.

the Nepal Geological Society, Society of Mathematics, Society of Statistics and Society of Women in Science and Technology were present during the discussion. The representatives pointed out various problems faced by the societies like registration and renewal of Society, lack of fund to do research, organise scientific gatherings, need of a National Science Library and publish journals etc. After the discussion, Dr. K.L. Shrestha requested the representatives of the professional societies to give their views and suggestions on the role of the Ministry of Science and Technology and its relation with the scientific professional societies. Follow-up meeting was attended by Mr. Basu Dev Kharel, Vice-President, NGS on 18 March 1999. This meeting has decided to conduct a workshop by the Ministry of Science and Technology on Problems and Prospects of Scientific Professional Societies in Nepal.

On request of Department of Roads, Road Maintenance and Development Project (RMDP), Mr. K.P. Kaphle, Former President, on behalf of the Nepal Geological Society has actively participated in the discussion, put comments and gave suggestions on the Draft EIA report of five roads: 1. Chamliya - Darchula, 2. Sanfebagar - Martadi, 3. Sanfebagar - Mangalsen, 4. Kalikot - Jumla and 5. Dhaura - Jajarkot prepared by consultants on 6 April 1999. These roads are going to be constructed under the Proposed Road Maintenance and Development Project with the help of World Bank Loan. He also participated in the presentation and discussion on EIA report of proposed Road Maintenance and Development Project on 15 April 1999.

Nepalese Members of International Association of Engineering Geology and the Environment (IAEG)

List of Members with Bulletin subscription

1. Dr. Sandeep Shah
G.P.O. Box 3840
Kathmandu, Nepal
2. Mr. Govind Sharma Pokharel
P.O. Box 11137
Kathmandu, Nepal
3. Mr. Indra Raj Humagain
P.O. Box 231
Kathmandu, Nepal
4. Mr. Rabindra Thakuri
Butwal Power Company
P.O. Box 13488
Kathmandu, Nepal
5. Mr. Narayan Singh
GEOCE Consultants (P) Ltd.
P.O. Box 4266
Kathmandu, Nepal

List of Members without Journal subscription

1. Professor Dr. B.N. Upreti
2. Mr. K.C. Manandhar (for 2 years)
3. Dr. M.R. Dhital (for 2 years)
4. Mr. G.M. Shrestha
5. Mr. D.B. Thapa
6. Mr. M.R. Poudel
7. Mr. Ram Sharma Poudel
8. Mr. K.M. Nepal
9. Dr. V. Dangol
10. Mr. K.P. Kaphle
11. Mr. J.N. Shrestha
12. Mr. A.M. Dixit
13. Mr. A. Koirala
14. Mr. K.K. Rajbhandari
15. Mr. Krishna Murari Amatya
16. Mr. A.N. Bhandari
17. Ms. Roshani Karmacharya
18. Mr. Subash Chandra Sunuwar
19. Mr. Bruce O'Neill
20. Mr. Jayakar Gauchan

NEW MEMBERS OF THE NEPAL GEOLOGICAL SOCIETY

Membership Number	Name	Mailing Address
M-415	Ishor Poudel	Institute of Engineering Pulchowk Campus, Lalitpur, Nepal Tel: 272572 @
LM-416	Prof. Dr. Aftab Ahmad Butt	Institute of Geology, Punjab University Lahore, Pakistan Tel: 092-42-410229 (Of)
LM-417	Mr. Narad Thakuri	Sahayogi Higher Secondary School Gokarna, Kathmandu, Nepal Tel: 470394 (Of)
LM-418	Dr. Vinod C. Tewari	Wadia Institute of Himalayan Geology 33 General Mahadeo Singh Road Dehradun 248 India Tel: 627380 (Of), Fax: 0135-625312
LM-419	Mr. Binod Chapagai	P.O.Box-46, Kathmandu, Nepal Tel: 421463 (Of)
LM-420	Mr. Dharma Raj Khadka	Department of Mines and Geology Lainchaur, Kathmandu, Nepal Tel: 416528 (Of)
LM-421	Mr. Tuk Lal Adhikari	ITECO Nepal (P) Ltd. Min Bhawan, Kathmandu, Nepal Tel: 491908 (Res.)
LM-422	Mr. Madhur Kumar Shrestha	Churia Forest Development Project GTZ, P.O.Box-1457, Kathmandu, Nepal Tel: 538365 (Res.)
LM-423	Ms. Anke Krueger	Krachenhoop - 26,38448 Wholschburg, Tel: 412872 (DMG Officer, Nepal), Germany
LM-424	Mr. Katsuhiko Asahi	Laboratory of Geoecology, Hokkaido University N10W8, Sapporo, 060-0810, Japan.
LM-425	Mr. Moti Lal Rijal	Department of Geology, Tri-Chandra Campus Ghantaghar, Kathmandu, Nepal
LM-426	Mr. Raja P. Upadhyay	274 Union Blue # 200 Lakewood Colorado 802228, USA
LM-427	Ms. Christina Ann Neal	USGS, 4200 University Drive Anchorage, Alaska-99508, USA
LM-428	Dr. Louis A. Derry	Dept. of Geological Sciences Cornell University, Itjaca, NY 14853, USA.
LM-429	Mr. Subodh Dhakal	Godawari Marble Industries (P) Ltd. Kathmandu, Nepal.
LM-430	Dr. Katsuhiko Nakayama	Dept. of Geo-science, Shimane University Nishikawatsu, Matsue, 690-8504, Japan
LM-431	Dr. Jean-Philippe Avouac	LDG, BP 12, 91680, Bruyeres-Le-Chatel, France
LM-432	Mr. Perrier Frederic	DASE/ LDG BP 12, 91680, Bruyeres-Le-Chatel, France
LM-433	Mr. Purnendu Sen	Director, Geological Survey of India Eastern Region, India
LM-434	Mr. Krishna Basnet	Soil Rock & Concrete Laboratory Soyambhu, Kathandu, Nepal
LM-435	Dr. Gyaneshwor Pokharel	Soil Mechanics Division, Public Works Research Inst. Min. of Construction, Tsukuba, 305-0804, Japan
LM-436	Dr. Ottinger Peter	South Asia Institute, University of Heidelberg Sanepa, Kathmandu

Wishing Grand Success
to
International Symposium on
“Engineering Geology, Hydrogeology and
Natural Disaster with Emphasis on Asia”
Kathmandu, Nepal
September 28-30, 1999
organised by
NEPAL GEOLOGICAL SOCIETY



Shah Consult International (P.) Ltd.

ENGINEERING, ARCHITECTURE, PLANNING & MANAGEMENT CONSULTANTS

BANESWOR
G.P.O. BOX NO. 3840
KATHMANDU, NEPAL

PHONE: +977-1-471852
FAX: +977-1-471852

GEO-SCIENTIFIC TALK PROGRAMMES

The Nepal Geological Society has organised a series of Geo-scientific talk programs/ lectures on various topics by inviting the distinguished international scientists and researchers in the year 1998/1999.

- The first of the series was on **Tunnelling in Heterogeneous and Weak Rock Mass: The Metro of Athens a case** by Prof. Paul G. Marinos, National Technical University of Athens, Greece and the President of IAEG, on 16 January 1998 in the seminar hall of DPTC.
- The second lecture was on the **Evolution of the Himalayan Orogeny** by Dr. G. Fuchs on 1 November 1998 in the auditorium of the Department of Mines and Geology.
- "Why Study the Pollen Grains?" was the third talk programme delivered by Dr

David Kay Fergusson in the auditorium of the Department of Mines and Geology on 22 December 1998.

- The fourth lecture was on **Environmental Change and Mammalian Evolution in East Asia During the Late Tertiary and Quaternary** by Prof. Nina G. Jablonski, Fulbright Professor, Central Department of Geology, Tribhuvan University on 6 January 1999 in the auditorium of the Department of Mines and Geology.
- Similarly the fifth lecture was organised on **Seismo-tectonic of Central Himalayas: Current Knowledge**, by Dr. J.P. Avouac, Teledetection and Seismic Risk Section, Laboratoires de Geophysique, (LDG) France, on 20 January 1999 in the auditorium of the Department of Mines and Geology.

CALENDAR OF EVENTS OF THE YEAR 1999/2000

- ★ the Nepal Geological Society under the sponsorship of International Association for Engineering Geology and the Environment (IAEG) and Endorsed by International Decade for Natural Disaster Reduction (IDNDR) Secretariat, Geneva, Switzerland, and also in association with various national and international organisations, is going to organise an international **Symposium on ENGINEERING GEOLOGY, HYDRO-GEOLOGY AND NATURAL DISASTER WITH EMPHASIS ON ASIA**, in Kathmandu, Nepal, on 28 -30 September 1999. For contact address see announcement above.

- ★ Nepal Engineers' Association, Bangkok Centre, and National Society for Earthquake Technology Nepal is going to organise jointly an **International Seminar on Challenges in Infrastructure Development in Kathmandu Valley at AIT Bangkok on May 23, 1999.**

Contact Address:

Mr. Dinesh Raj Manandhar
Mail Box no 672, AIT

P.O.Box 4, Khlong, Luang, Pathumthani,
12120 Thailand
Tel: +66-2-524-7911, Fax: +66-2-524- 5625
e-mail: wra89802@ait.ac.th

- ★ **XIXth Congress of the International Society for Photogrammetry and Remote Sensing (ISPRS)** is going to be held in Amsterdam, The Netherlands on 16-23 July 1999.

Contact Address:

Secretariat: ISPRS Organising Committee
C/O ITC Attn Ms Saskia Tempelman
P.O. Box 6
7500 AA Enschede, The Netherlands
Tel: +31-53-4874358
Fax: +31-53-4874335
E-mail: isprs@ite.nl

- ★ **Asian Disaster Preparedness Centre (ADPC) Foundation** in collaboration with International Union of Local Authorities, Asia and Pacific Section (IULA- ASPAC) is going to organise **Second Regional Training Course on Urban Disaster Mitigation** under the Asian Urban Disaster Mitigation Programme (AUDMP) on 17-28 May 1999 Bangkok, Thailand.

Best Wishes for the Grand Success

of

**International Symposium
on
Engineering Geology, Hydrogeology and
Natural Disasters with Emphasis on Asia
organised by
NEPAL GEOLOGICAL SOCIETY**

To be held on Sept. 28-30, 1999

SOIL TEST Pvt. Ltd.
Naya Baneswar, Kathmandu

Tel.: 494946, 495246; Fax: 470551
e-mail: soiltest@mos.com.np

Complete Geotechnical Services - Civil Engineering Designs and
Supervision - Fully Equipped Quality Control Laboratory -
Environmental Laboratory for Environmental Monitoring and
Chemical Analysis.

Contact Address:

Aloysius J.Rego, Senior Manager
Learning and Professional Development
AIT, P.O.Box, 4, Klong Luang,
Pathumthani 12120, Thailand.
Tel: (662) 5245391
Fax: (662) 5245360
E-mail: lpdadpc@ait.ac.th

- ★ International Mine Water Association (AMWA) is going to organise an **International Congress of Mine Water & Environment for the 21st Century, Mine/ Quarry: Waste Disposal & Closure** at Seville, Spain, on September 13 - 17, 1999.

Contact Address:

Organising Committee, Congress Secretariat
FRASA Consulting Engineers, S.L.Luma 45
Tel: +3491-622-1078, Fax: +3491-622-1983
E-mail: frasaing@mx4.redestb.es

- ★ International Association of Engineering Geology and Environment (IAEG), Malaysian National Group is going to organise **2nd Asian Symposium on Engineering Geology and the**

Environment, Engineering Geology: Planning for Sustainable Development at Institute of Geology Malaysia on 23-25 September 1999.

Contact Address:

Institute of Environment & Development
University of Kebangsaan Malaysia,
43600 Bangi Selangor, Malaysia
Tel: 603-8296135, Fax: 603-8255104
E-mail: lestari@pkriscc.cc.ukn.my

- ★ International Association of Engineering Geology and Environment (IAEG) is going to organise an **International Workshop on Engineering Geology and Environment Planning**, sponsored by IAEG and Co-sponsored by UNESCO Earth Science Division and Federal Institute for Geosciences and Natural Resources (BGR) in Hannover, Germany on October 10- 12, 2000.

Contact Address:

Dr.M Walner
BGR, P.O.Box-510153
D-30631, Hannover, Germany
Tel:+49511-643-2422, Fax:+49511-643-364, E-mail:manfred.wallner@bgr.de

AWARD

1998-UN Merituous Certificate for the disaster Prevention to Nepal Geological Society

The Jury of 1998-UN Sasakawa Disaster Prevention Award has awarded the 1998 Merituous Certificate for the Disaster Prevention

to the Nepal Geological Society for its efforts in disseminating the scientific knowledge and spreading the awareness of prevention of the natural disaster. The award is announced by UN Humanitarian and Emergency Relief Coordination Office of IDNDR Secretariat in Geneva, Switzerland.

FILM SHOW

A documentary film on **Himalayan Geology** titled as **The Roof of the World** prepared by BBC (45 minutes) was shown to

the members of NGS and other interested persons on 21 February 1999 in the auditorium of the Department of Mines and geology.

AWARENESS

- ★ भूदृचालोबाट कसरी जोगिने ? नेपाल भौवर्भिक समाज, सन् १९९९
- ★ Earthquake Scenario of Kathmandu, Valley (Published by NSET-Nepal, 1998).
- ★ Comprehensive Data Base (Basic Information) on Natural Disaster

Management Capabilities in Nepal. Report prepared by K.P. Kaphle and M. Nakarmi/ NGS for UNDP/DMS, Kathmandu, Nepal, 1997.

- ★ 26 Things that help you to survive in an Earthquake (by LWF)

Best Wishes
and
Hearty Felicitations
on
the Auspicious Occasion
of
Organising International Symposium on
“Engineering Geology, Hydrogeology and
Natural Disasters with Emphasis on Asia

Kathmandu, Nepal

September 28-30, 1999

by

THE NEPAL GEOLOGICAL SOCIETY

HETAUDA CEMENT INDUSTRIES LTD.

Hetauda, Nepal

Use Hetauda Cement
for Quality & Strength

(a) During an Earthquake:

1. Stay Calm
2. Inside : Stand in a door way, or crouch under a desk or Table, away from Windows or glass dividers,
3. Outside: Stand away from buildings, trees, telephone and electric lines.
4. On the Road: Drive away from underpasses/overpasses; stop in safe area; Stay in vehicle.

(b) After an Earthquake:

1. Check for injuries and try your best to provide first aid.
2. Check for safety for gas, water, sewage breaks; check for downed electric lines and shorts; turn off appropriate utilities; check for building damage and potential safety problems during after shocks such as cracks around chimney and foundation.
3. Clean up dangerous spills.
4. Wear shoes.
5. Turn on radio and listen for instructions from public safety agencies.
6. Do not use the telephone except for emergency use.

(c) 13 Survival items to keep on hand:

1. Portable radio with extra batteries.
2. Flashlight with extra batteries.
3. Fire Aid Kit-including specific medicines needed for members of your household.
4. First Aid book.
5. Fire extinguisher.
6. Adjustable wrench for turning of gas and water.
7. Portable fire escape ladder for homes/apartments with multiple floors.
8. Bottled water- sufficient for the number of members in your household.
9. Canned and dried foods sufficient for a week for each member of your household.
10. Non-electric can opener.
11. Portable stove such as butane or charcoal.
12. Matches.
13. Telephone numbers of police, fire and doctor.

(d) Things you need to know:

1. How to run off gas, water and electricity.
2. First Aid.
3. Plan for reuniting your family.

Source: Lutheran World Federation, Nepal-Disaster Preparedness Project, Kathmandu

RECENT PUBLICATIONS (NEW BOOKS)

Dynamic Himalaya: By Prof. K.S. Valdiya. Published by University press (India)Ltd. Hyderabad, Distributed by Orint Longman Limited Calcutta, New Delhi, Patna, Lucknow, Mumbai (Bombay).

Guide to Scientific and Technical Writing: By Prof. P.G. Cooray, 426 Mahakanda Road, Hindagala, Sri Lanka. Tel (08) 88541). Price US\$5.00.

Geological Field Notes and Sketches: By Prof. P.G. Cooray, 426 Mahakanda Road, Hindagala, Sri Lanka Tel (08) 88541). Price US\$5.00.

Critical Aspects of the Plate Tectonics Theory, Vol.1: Criticism on the Plate Tectonics Theory: Edited by Prof. V. Belousov, 1990, 435 pages Price US\$50.00. ISBN 960-7457-02-1.

Theophrastus' Contribution to Advanced Studies in Geology, Volume II: Edited by Prof. S.S. Augustithis et al, 1998, 281 pages, ISBN 960-7457-12-9. Price US\$45 (post free).

Atlas of granitization Textures and Processes: By S.S. Augustuthis, 1993. 500 pages, ISBN 960-7457-08-0. Price US\$75, (post free).

Magma - Crust Interactions and evolution (Geochemical and Geophysical Aspects of the Interactions and Evolution of Magmas and Rocks of the Crust): Edited by Prof. B. Bonin et al. 1989, 362 Pages, Price US\$38.00 (post free).

Atlas of the Textural Patterns of Metamorphosed (Transformed and deformed) Rocks and Their Genetic Significance: By S.S. Augustithis 1985, 401 pages, Price US\$65.00 (post free).

Practical Applications of Trace Elements and Isotopes to Environmental Biogeochemistry and Mineral Resources Evaluation. Edited by Prof. R.W. Hurst et al. 1987, 254 pages, Price US\$30.00 (post free).

A Global Geology by P.W. Harben and M. Kuzvart, 1997, Price US\$198.

Best Wishes for the Grand Success

of

International Symposium

on

Engineering Geology, Hydrogeology and

Natural Disasters with Emphasis on Asia

organised by

NEPAL GEOLOGICAL SOCIETY

To be held on Sept. 28-30, 1999

NADCO

National Drilling Company Pvt. Ltd.

Naya Baneshwar, Kathmandu

Tel.: 494946, 495246; Fax: 470551
e-mail: soiltest@mos.com.np

Over 2 decades' experience in waterwell drilling and pile foundations

ANNOUNCEMENT

The Nepal Geological Society under the sponsorship of International Association for Engineering Geology and the Environment (IAEG) and Endorsed by International Decade for Natural Disaster Reduction (IDNDR) Secretariat, Geneva, Switzerland and also in association with various national and international organisations, is going to organize an International Symposium on **ENGINEERING GEOLOGY, HYDROGEOLOGY AND NATURAL DISASTER WITH EMPHASIS ON ASIA**, in Kathmandu, Nepal, on 28-30, September 1999.

The Nepal Geological Society requests all its members and related national and international professionals and researchers for active participation in the coming Symposium by contributing their scientific research papers. Registration fee for attending the Symposium will be as following:

SAARC Countries US\$ 60.00

Other countries US\$ 150.00

Students will receive 50% discount on above fees.

The Pre-Registration Form is available at NGS Office, Kathmandu, Nepal.

So far 260 Pre-Registration Forms from 37 countries (Europe, America, Japan, South Asia, West Asia, China and others) are received. Some more Forms are expected. For further details, please refer to the Second Announcement / Circular released in April 1999.

Important Deadlines

May 31, 1999: Last date of submission of Pre-Registration Form

May 31, 1999: Submission of Abstract

September 28-30, 1999: Symposium

Sept. 30, 1999: Submission of full Papers

Contact Address:

Prof. B.N. Upreti

Convenor of the Symposium

c/o Department of Geology, Tri-Chandra Campus

Ghantaghar, Kathmandu, Nepal

Phone: 0977-1-416386 (Res.)

Fax: 977-1-416870

e-mail: ngs@wlink.com.np

Mr. B.D. Kharel

Co-Convenor of the Symposium

c/o Department of Mines and Geology

Phone: 0977-1-413965 (Res.) 416528 (Off.)

e-mail: ngs@wlink.com.np

(Second Announcement / Circular with detail information is already in circulation)

CUTTINGS FROM NEWSPAPERS

(The Rising Nepal, October 17, 1998)

NGS named for UN Sasakawa Award

Kathmandu, Oct. 16 (RSS):

Nepal Geological Society (NGS) has been named one of the five recipients of the 1998 certificate of merit for the UN Sasakawa Award this year.

Under-secretary general for humanitarian affairs and emergency relief coordination, Mr Sergio Vierra De Mello, announced this on the occasion of the 1998 International Day for Natural Disaster Reduction, at a function held in Geneva by the secretariat of International Decade for Natural Disaster Reduction (IDNDR) on Wednesday, according to the Nepalese Permanent Mission in Geneva.

The award is given to those institutions or persons, who have made important contribution to disaster prevention.

This year, the UN Sasakawa award has been awarded to the Chinese Ministry of Civil Affairs Quo Ji Cai Rang and Professor Wang Ang-Sheng from the Chinese Academy of Sciences, four certificates of distinction for the runners-up for the award were also awarded to the national survey for seismic protection of the Republic of Armenia; the Australian IDNDR Coordination Committee; the Academy of Scientific Research and Technology of Egypt and the National Disaster Prevention Centre of Mexico.

गोरखापत्र २०१५ साल असोज २९ गते बिहिबार (October 15, 1998)

प्राकृतिक प्रकोपको मारबाट विकासोन्मुख राष्ट्र बढि प्रभावित

काठमाडौं, असोज २८ गते । विश्वमा प्राकृतिक प्रकोपको मारबाट विकासशील राष्ट्रहरू बढि प्रभावित हुने गर 'का र त्यसबाट पर्ने असरलाई कम गर्ने सञ्चार माध्यमको महत्वपूर्ण भूमिका हुने बताइएको छ ।

संयुक्त राष्ट्रसंघले यो दशकलाई 'प्राकृतिक प्रकोप न्यूनीकरणका लागि अन्तर्राष्ट्रिय दशक' मनाउने घोषणा गर 'अनुरूप आज प्राकृतिक प्रकोप न्यूनीकरण दिवस सम्पन्न भयो ।

सोही क्रममा नेपाल भौगर्भिक समाजद्वारा आज यहाँ आयोजित 'भूकम्प व्यवस्थापनमा सञ्चार माध्यम' विषयक गोष्ठीमा नेपालमा प्रकोप व्यवस्थापनबारे स्थानीय स्तरमा कार्यक्रम सञ्चालन गर्नुपर्ने कुरामा जोड दिइएको थियो ।

उक्त गोष्ठीको उद्घाटनका अवसरमा बोल्नुहुँदै गृहमन्त्री गोविन्दराज जोशीले नेपालमा बाढी, पहिरो, भूकम्प जस्ता प्राकृतिक प्रकोपबाट बर्सात धेरै नोक्सानी भइरहेको र यस क्षेत्रमा धेरै व्यवसायिक संस्थाहरूले सहयोग गर्दै आएको बताउनुभयो ।

उहाँले, यस्ता विषयहरूमा सञ्चार माध्यमको महत्वपूर्ण भूमिका रहने र सही सूचनाले सर्वसाधारणलाई सचेत बनाई धेरैको ज्यान जोगाउन मद्दत पुग्ने विचार व्यक्त गर्नुभयो ।

सञ्चार माध्यमले यस किसिमका विषयमा सही सूचना दिनुपर्ने उल्लेख गर्दै मन्त्री जोशीले खराब सूचनाबाट सर्वसाधारणलाई पीडा पुग्ने उल्लेख गर्नुभयो ।

त्यस्तै खानी तथा भूगर्भ विभागका निर्देशक गोपालसिंह थापाले नेपालमा फरक मौसमी क्षेत्रहरू रहेको र नेपाल भूकम्पीय जोखिम क्षेत्रभित्र पर्ने हुँदा यसतर्फ सचेत रहनु पर्ने आवश्यकतामा जोड दिनुभयो ।

खानी तथा भूगर्भ विभागले भूकम्पबारे अध्ययन गरिरहेको उल्लेख गर्दै अहिले केही अखबारहरूमा भूकम्पबारे बढाई चढाई समाचारहरू प्रकाशित भएको बताउनुभयो ।

गृह सचिव पद्मप्रसाद पोखरेलको संभाषित्वमा भएको उक्त कार्यक्रममा रमेशकुमार अर्वाल, आमोदमणि दीक्षितसगायतका वक्ताहरूले मन्तव्य व्यक्त गर्नुभएको थियो ।

सोही अवसरमा 'प्रकोप व्यवस्थापनमा पत्रकारहरूको भूमिका' विषयक तालिममा सहभागी पत्रकारहरूलाई प्रमाणपत्र वितरण गरिएको थियो ।

प्राकृतिक प्रकोपमा संचारको भूमिका महत्त्वपूर्ण

काठमाडौं, २८ असोज सञ्चारमाध्यमहरूले प्राकृतिक प्रकोप न्यूनीकरण गर्नेबारेमा सरकार र जनतालाई महत्त्वपूर्ण सहयोग पुर्याउनसक्ने कुरा बुझाउन आयोजित 'प्राकृतिक प्रकोप न्यूनीकरण दिवस' को अवसरमा विभिन्न वक्ताहरूले बोलाएका छन् ।

संयुक्त राष्ट्रसंघले यस वर्षका लागि 'प्राकृतिक प्रकोप रोकथाम र संचारमाध्यम' लाई अन्तर्राष्ट्रिय नारा बनाएको छ । राष्ट्रसंघले सन् १९९० देखि २००० सम्मको दशकलाई 'प्राकृतिक प्रकोप न्यूनीकरण अन्तर्राष्ट्रिय दशक' घोषणा गरेको छ र प्रत्येक वर्षको अक्टुबर महिनाको चौथो बुधवार विश्वभरि प्राकृतिक प्रकोप दिवस मनाउने गरेको छ ।

प्राकृतिक प्रकोप न्यूनीकरण दशक केन्द्रीय समितिका अध्यक्ष एवं गृहमन्त्री गोविन्दराज जोशीले केन्द्रीय समितिले प्राकृतिक प्रकोपसँग सम्बन्धित सरकारका सबै निकायहरूलाई प्रकोप न्यूनीकरण गर्ने काम सुम्पिएको बताउनुभयो । जोशीले भन्नुभयो, 'संचारमाध्यमले समयमै सही समाचार दिन सकेमा प्रकोपबाट धेरै मानिसको ज्यान जोगाउन सकिन्छ ।'

उद्घाटन समारोहमा गृह सचिव पद्मप्रसाद पोखरेलले प्राकृतिक प्रकोपसम्बन्धी अध्ययनहरूलाई व्यवहारमा उतार्नुपर्ने बताउनुभयो ।

नेपाल भौगर्भिक समाजका अध्यक्ष रमेश कुमार अर्वाल, वरिष्ठ भूगर्भविद् आमोदमणि दीक्षित, संयुक्त राष्ट्रसंघीय विकास कार्यक्रम, नेपालका लागि प्रकोप व्यवस्थापन सचिवालयका विलियम एस. बर्गरले पनि प्रकोप रोकथाममा संचारमाध्यमले महत्त्वपूर्ण योगदान दिनसक्ने बताउनुभयो । बर्गरले प्राकृतिक प्रकोप न्यूनीकरण दशकका बारेमा नेपाल भौगर्भिक समाजले उल्लेख योगदान गरेकापछि सन् १९९३ को प्रकोप रोकथामसम्बन्धी ५० हजार अमेरिकी डलरको सकाकावा पुरस्कार प्रदान गरिने जानकारी पनि दिनुभयो ।

नेपाल भौगर्भिक समाज, प्राकृतिक प्रकोप न्यूनीकरण दशक केन्द्रीय समिति तथा जल उत्पन्न प्रकोप नियन्त्रण केन्द्र तथा लुधरन वर्ल्ड फोडरेसन तथा नेपाल भूकम्प प्रविधि समाजले संयुक्त रूपमा आयोजना गरेको प्रकोप दिवसको उद्घाटन समारोहमा भूगर्भ तथा खानी विभागका निर्देशक गोपालसिंह थापा, जल उत्पन्न प्रकोप नियन्त्रण केन्द्रका सल्लाहकार मासो ओकामोतोलगायतका वक्ताहरूले बोलेका थिए ।

समारोहका प्रमुख अतिथि गृहमन्त्री जोशीले प्राकृतिक प्रकोपसम्बन्धी तालिममा सहभागी पत्रकारहरूलाई प्रमाणपत्र प्रदान गर्नुभएको थियो ।

प्राकृतिक प्रकोप दिवसका अवसरमा भूगर्भविद् कृष्णप्रसाद काफ्ले, गृह मन्त्रालयका डा. मीनबहादुर पौडेल, भूगर्भविद् आमोदमणि दीक्षित, डा. रामप्रसाद श्रेष्ठ, पत्रकार विजयमणि पोखरेल तथा श्रीरामसिंह बस्नेतलगायतले विभिन्न कार्यक्रम प्रस्तुत गर्नुभएको थियो ।

First Earthquake Safety Day in Nepal

An annual **Earthquake Safety Day** in Nepal was established and held for the first time on 16 January 1999, the anniversary of the Great Bihar-Nepal Earthquake of 1934. The Earthquake Safety Day National Committee instituted by His Majesty's Government endorsed the Kathmandu Valley Earthquake Risk Management Program (KVERMP) activities as part of the first Earthquake Safety Day. KVERMP is a part of ADPC's Asian Urban Disaster Mitigation Program (AUDMP) managed by National Society for Earthquake Technology (NSET-Nepal) with assistance from Geo Hazards International, a non-profit foundation based in Stanford, California. On this occasion the Rt. Hon. Prime Minister Girija Prasad Koirala released the Kathmandu Valley Earthquake Risk Management Action Plan and the Earthquake Scenario of Kathmandu Valley. (Source: Asian Disaster Management News Vol.5, No.1, February 1999. ISSN 0858 - 6373).

CEMAT CONSULTANTS (PVT.) LTD.

(Civil, Electrical, Mechanical, Architectural and Transport Consultants)

G.P.O. Box: 3953

Kumari Path, Thapagaon

New Baneshwor, Kathmandu, Nepal

Tel.: 493198, 491439

Fax: 977-1-491598

E-mail: ceamat@wlink.com.np

Fields:

- ☐ Water Resources Development & Irrigation
- ☐ Water Supply & Sewerage
- ☐ Road, Highways & Bridges
- ☐ Commercial, Industrial & Other Complexes
- ☐ Power Engineering
- ☐ Urban Planning & Infrastructure Development
- ☐ Mechanical & Industrial Engineering
- ☐ Integrated Rural Development

Services:

- ☐ Preliminary Investigation and Feasibility Studies
- ☐ Assistance in Project Start-up
- ☐ Detailed Engineering, Tendering and Contract Negotiation
- ☐ Construction Supervision and Quality Control
- ☐ Project Management
- ☐ Socio-Economic and Environmental Studies

BIO-DATA OF HONORARY MEMBERS OF NGS

Koshiro Kizaki



- Date of Birth:** 16 September 1924
- Nationality:** Japanese
- Permanent Address:** Kinjo-cho 1-33-806, Shuri, Naha, Japan
- Education:**
- 1951 Graduate Hokkaido University, Faculty of Science, Department of Geology and Mineralogy, Japan.
 - 1952 Research Associate, Department of Geology and Mineralogy, Hokkaido University.
 - 1959 Doctor of Science, Hokkaido University, Japan
 - 1968 Associate Professor, Department of Geology and Mineralogy, Hokkaido University
 - 1972 Professor, Faculty of General Education, Ryukyu University, Japan
 - 1974-81 Councillor of Ryukyu University
 - 1979 Professor, Faculty of Science, Department of Oceanography, Ryukyu University
 - 1979-81 Leader of 21st Japanese Antarctic Research Expedition
 - 1979-82 Concurrent Professor, National Polar Research Institute, Japan
 - 1981 Visiting Professor to Kagoshima University and Yamaguchi University
 - 1990 Ryukyu University, Retired
 - 1993-95 Visiting Professor to the Central Department of Geology, Tribhuvan University, Kathmandu, Nepal
- Award:**
- 1952 Research Grant from the Geological Society of Japan
 - 1974 Award from Prince Chichibu Memorial Research Prize for "Geology of Nepal Himalaya" as a Joint Work
 - 1980 Cultural Prize from Okinawa Times, Japan
- Overseas Research Activities:**
- 1959-61 Member of Geological Study for 4th Japanese Antarctic Research Expedition
 - 1964-65 Observer of the Soviet Antarctic Expedition
 - 1965-68 Member of the Australian Antarctic Research Expedition
 - 1971 Member of Chile-Patagonia Research Expedition
 - 1975 Preliminary Research to Nepal Himalaya
 - 1976 Participate "Himalaya Seminar", the 100th Anniversary of Geological Survey of India as an Invited Participant.
 - 1976 Research Work in Kashmir and Nepal
 - 1979-80 Leader of the 21st Japanese Antarctic Research Expedition
 - 1980-88 Project Leader of Research Expedition for "Crustal movement of the Nepal Himalaya"
- Membership of Academic Society:**
- 1950 Geological Society of Japan
 - 1952 Japanese Association of Petrology and Mineralogy
 - 1953 Japanese Association of Mining Geology
 - 1960 Japanese Association of Snow and Ice
 - 1963-72 Member of Antarctic Special Committee for Japanese Academic Council
 - 1967-70 Member of Core Study Subcommittee of IGCU
 - 1968-73 Member of Planning Committee of the Antarctic Research Expedition
 - 1975-85 Council Member of Geological Society of Japan
 - 1977-89 Member of Antarctic Geology, National Polar Research Institute of Japan
 - 1981-88 Council Member of the National Polar Research Institute of Japan
 - 1988-90 Vice-President of Geological Society of Japan
 - 1989-93 President of the Okinawa International Association for Mangrove
 - 1996 Chairman of the Himalayan Committee, Geological Society of Japan
Life Member of the Nepal Geological Society

Madhab Raj Pandey



Date of Birth: 15 June 1945

Home Address: Gha 1/327, Gyaneshwor, Kathmandu

Qualifications: M.Sc. Exploration Geophysics (1969), St. Petersburg Mining Institute, Russia

Training: -Integrated Method of Mineral Exploration (14 months), 1975, St. Petersburg Mining Institute, Russia
-Seismology, (3 months), 1980, Paris University, France
-Experimental Seismology (3 months), 1982, Institute of Physics of Earth, Paris
-Geological Hazards (1 month) 1985, USGS, Denver, Colorado, USA
-Seismology (1 month each) in 1986 & 1988 LDG, France

Language: English, Russian, Hindi, French (spoken only).

Member of Professional Societies:

- (a) Life Member of the Nepal Geological Society (NGS)
- (b) Member of American Geophysical Union (AGU)
- (c) National Society for Earthquake Technology Nepal (NSET-Nepal)

Service Records: - **Exploration Geologist** (From 1969 to 1975), Dept. of Mines & Geology.
- **Senior Divisional Geologists (Senior Seismologist)**, (From 1975 to present), Department of Mines and Geology.

Professional Experience: -From 1969 to 1976: worked as **Exploration Geologist** and conducted geophysical exploration for metallic mineral deposits and hydrocarbon exploration.
-From 1978 to present: working as **Chief, National Seismological Laboratory of Department of Mines and Geology**.
-Major contribution in the establishment of National Seismological Networks in Nepal.
-Major contribution in the Publication of Microseismicity Map of Nepal and Adjacent Regions.
-From 1997 to present: **Chairman** of National Committee for International Geological Correlation Programme (IGCP).

Seminars & Workshops Attended:

- Comparison of Active Faults of the world, IGCP Project, 206, China, 1984
- IASPEI Meeting, 1984, NGRI, Hyderabad, India
- Himalaya - Karakoram - Tibet International Workshop/ Seminar in 1994, Kathmandu, Nepal
- First Nepal Geological Congress, 1995, NGS, Kathmandu, Nepal
- Second Nepal Geological Congress, 1997, NGS, Kathmandu, Nepal
- Global Seismological Hazard Assessment Project, 1994, China
- Asian Seismological Commission First Meeting, IASPEI, Regional Assembly in Asia, 1996, Tangshan, China.
- INDO-US Workshop on Paleoseismicity, 1997, Wadia Institute of Himalayan Geology, Dehra-Dun, India.
- Asian Seismological Commission Second Meeting, 1998, NGRI, Hyderabad, India.

Publications:

Velocity Determination of Kathmandu Complex - M. R. Pandey, Jour. of Nepal Geol. Soc., Vol 1 No. 1, pp 29-35, 1981.
Features of the P-waves propagated in the crust of the Himalayas - J. C. Lepine, A. Hirn, M. R. Pandey, J.M. Tater, Annales Geophysicae, 2, 2, pp 119 - 122, 1984.

- Crustal structure and variability of the Himalayan border of Tibet - A. Hirn et al., *Nature* Vol. 307 No 5946, pp 23 - 25, 5 Jan. 1984
- Seismic model of central and eastern lesser Himalaya of Nepal - M. R. Pandey, *Jour. of Nepal Geol. Soc.*, Vol 3 No. 1 & 2, pp 1-11, 1985.
- Historical earthquakes of Nepal - Chitrakar G.R. and Pandey M.R., *Bull. Geol. Soc. Nepal*, 4, pp 7-8, 1986.
- The distribution of intensity of the Bihar-Nepal earthquake 15 January 1934 and bounds of the extent of the rupture zone - M. R. Pandey and Peter Molnar, *Jour. Nepal Geol. Soc.*, Vol 5 No. 1, pp 22-44, 1988.
- The aftershock sequence of the Udayapur earthquake of August 20 - Pandey, M.R. and M. Nicolas, 1988, *Jour. of Nepal Geol. Soc. Nepal*, Vol PP , 1989.
- Rupture zones of great earthquakes of the Himalayan region - Peter Molnar and M. R. Pandey, *Proc. Indian Acad. Sci. (Earth Planet. Sci.)*, Vol 98, No, pp 61-70, 1 April 1989.
- P-wave residuals at stations in Nepal: Evidence for a high velocity region beneath Karnakorum - M. R. Pandey, Steven W. Roecker, and Peter Molnar, *Geop. Res. Let.*, Vol. 18, No. 10, pp 1909 - 1912, Oct. 1991.
- Ground classification (microzonation) of Kathmandu valley on the basis of microtremor survey, M. R. Pandey et al., *Bull. Dept. Geology, Tribhuvan Univ., Kathmandu, Nepal*, V. 2 No 1 (Proc. Symp. "Geodynamics of the Nepal Himalaya", pp 181-189, 1992.
- Interseismic Strain Accumulation on the Himalayan Crustal Ramp (Nepal) - Pandey, M.R., R.P. Tandukar, J.P. Avouac, J. Lavé and J.P. Massot, *Geophys. Res. Let.*, 22, pp 751-754, 1995.
- Indo-Asian Convergence rates in the Nepal Himalaya - Bilham, R., K. Larson, J. Freymuller and Project IDYLHIM members, *Nature*, 386, pp 61-66, 1997.
- Crustal structure and variability of the Himalayan border of Tibet - Hirn, A., Lepine J. C., Jobert G., Sapin M., Wülfinger G., Xu Z. X., Gao E. Y., Wang, X. J., Teng J. W., Xiong S. B., Pandey M. R., Tater J. M., *Nature*, v 307, pp 23-25, 1984a.
- Lesser Himalaya to Qang Tang: a 500 km teleseismic deployment to test geodynamic models - Hirn, A., Nercessian A., Sapin M., Lepine J. C., Sachpazi M., Ferrazzi V., Jiang M., Lu Q. T., Shi D. N., Ma K., Pandey M. R., Diaz J., and Gallart J., *Jour. of Nepal Geol. Soc.*, Vol. 9, Proceedings of 9th Himalayan-Karakorum-Tibet Workshop, Kathmandu, pp 39-52, 1995.
- Seismic anisotropy as a indicator of mantle flow beneath the Himalayas and Tibet: Hirn A., Jiang M., Sapin M., Diaz J., Nercessian A., Lu Q. T., Lepine J. C., Shi D. N., Sachpazi M., Pandey M. R., Ma K., and Gallart J., *Nature*, v. 375, pp. 571-574, 1995.
- Characteristics of Seismicity of Nepal and their Seismo-tectonic Implications: M. R. Pandey, R. P. Tandukar, J. P. Avouac, J. Vergne, and Th. Heritier (in press).

*Best Wishes and
Hearty Felicitations
to*

NEPAL GEOLOGICAL SOCIETY

Maruti Coal Uddyog

(The Coal Mine)

Ghorahi Dang - Tel.: 082-60092, 60238

Kathmandu Office - Tel.: 492379

*We supply coal suitable for -
Bricks and Tiles Uddyog, Cement Factory etc.*

OBITUARY

Professor Dr. John H. Gray (Life Member of Nepal Geological Society) died in 1998. He was a great scientist and active member of the Nepal Geological Society. Dr. Gray was born on 24th November, 1924 at Tioga, Texas, USA.

He did his M.S. in geology from Texas College of Mines and Metallurgy, USA in 1948.

Professor Dr. Gray had made great contribution in the development of geology of the USA. He was the District Geologist of Lion O.I. Company from 1948 to 1952. Then he worked as the Chief Geologist of the Munoco Company from 1955 to 1970. Between 1970 and 1998, he was an independent Oil Operator and Consultant. He was also the Director of UNITAR, Rome, Italy, from 1984 to 1985, and Professor of Geology of South Arkansas University, USA, from 1977 to 1980.

Professor Gray was also involved in the following professional societies:

- Geological Society of America,
- S.E.P.M.,
- A.A.P.G., and
- Society of Independent Professional Earth Scientist.

**We wish a grand success to the
International Symposium
on
Engineering Geology, Hydrogeology and
Natural Disaster with Emphasis on Asia
Kathmandu, Nepal, Sept. 28-30, 1999**



ESTD. 1967

NATRAJ
TOURS & TRAVELS (P) LTD.

*We assure every delegate our best services
and pleasant stay in Nepal*

P. P. Prasai
Managing Director

P. O. Box 495, Ghantaghar, Kamaladi, Kathmandu, Nepal
Phone: +977-1-249811, 222014, 222532, 220001, 222906, 247116, 249810
Res: +977-1-229277, 246253, 258011
Fax: +977-1-227372
Telex: 0891 2270 NATRAJ NP
Email: natraj@vishnu.ccsl.com.np



26 things to help you survive an earthquake

4 BASICS TO DO DURING AN EARTHQUAKE

1. STAY CALM
2. INSIDE: Stand in a doorway, or crouch under a desk or table, away from windows or glass dividers.
3. OUTSIDE: Stand away from buildings, trees, telephone and electric lines.
4. ON THE ROAD: Drive away from underpasses/overpasses; stop in safe area; stay in vehicle.

6 BASICS TO DO AFTER AN EARTHQUAKE

1. Check for injuries-provide first aid.
2. Check for safety-check for gas, water, sewage breaks; check for downed electric lines and shorts; turn off appropriate utilities; check for building damage and potential safety problems during after shocks such as cracks around chimney and foundation.
3. Clean up dangerous spills.
4. Wear shoes.
5. Turn on radio and listen for instructions from public safety agencies.
6. Don't use the telephone except for emergency use.

13 SURVIVAL ITEMS TO KEEP ON HAND

1. Portable radio with extra batteries.
2. Flashlight with extra batteries.
3. First Aid Kit - including specific medicines needed for members of your household.
4. First Aid Book.
5. Fire extinguisher.
6. Adjustable wrench for turning off gas and water
7. Portable fire escape ladder for homes/apartments with multiple floors.
8. Bottled water-sufficient for the number of members in your household.
9. Canned and dried foods sufficient for a week for each member of your household.
10. Non-electric can opener.
11. Portable stove such as butane or charcoal.
12. Matches.
13. Telephone numbers of police, fire and doctor.

3 THINGS YOU NEED TO KNOW

1. How to turn off gas, water and electricity
2. First Aid.
3. Plan for reuniting your family.

LUTHERAN WORLD FOUNDATION, NEPAL
Disaster Preparedness Project
Kathmandu